An Address
ON
REVERENCE AND HOPEFULNESS IN MEDICINE.

Delivered at the Opening of the Autumn Term in the Medical Faculty of the University of Liverpool, Oct. 1st, 1903,

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[SIR DYCE DUCKWORTH commenced by congratulating his fellow citizens on their wisdom and energy in seeking and securing the charter for their University. He then referred to Sir William Banks and others who had been foremost in promoting the establishment of the University and the welfare of the medical faculty. He alluded to the various celebrated inhabitants of Liverpool at the time when it suddenly grew from a village into a large commercial city and then went on to speak of the recent foundation of the several new universities in England. He laid great stress upon the necessity that every new university should insist upon a complete faculty of arts which should be the sole entrance-gate to the further and specialising work of all the other faculties. He proceeded:]

We hear much, perhaps a little too much, about original research in these days and the necessity for it, but, gentlemen, this matter does not concern you in your pupillary stage and is to be left till you have, by full and wide training, learned how to teach yourselves, mastered much of what is already known, and discovered what particular lines of inquiry you are qualified to pursue. It is to be hoped, however, that this school may find in your ranks some who will one day bring credit to it in this respect. These considerations are not, I venture to believe, out of place to-day when I address many amongst you who are now at the outset of a career in medicine. To equip yourselves fittingly for that profession will demand some knowledge of the several sciences on which the science and art of medicine are based. I say *some* knowledge, for you cannot in the nature of things become expert, as students, in any one of them. Medicine has been well termed "a jealous mistress," and if you are tempted to linger by the way in undue prosecution of one or other of the preliminary scientific studies you may be sure that you will lose your balance and never attain to excellence in practical medicine. The modern curriculum, while demanding adequate knowledge, yet affords none too much time for the work to be done. You may never venture to relax your efforts from to-day till such a time as you cease to face your examiners and it should be your earnest endeavour to be ready for each appointed examination that awaits you. Those of us who have had experience as examiners know well the difference between candidates who have had the benefit of a liberal education before they entered upon medical study and those who, although showing aptitude, have not had that advantage. It is the difference between efficiency and expertness, between width and narrowness. The one has studied with ease, the other with difficulty, and the consequent disability is apt to remain with the latter throughout his career. As with the literary so with the preliminary scientific part of your training, both should be accomplished before entering on the direct studies in medicine; and the tendency now and for the future is to remove the scientific work from the hospital schools altogether and to relegate it to late school life or the first academic year in a university. In thus re-casting the curriculum the student is set free to devote his whole time and energy to learning his profession and enabled to utilise to the full the opportunities afforded by his medical teachers and his hospital. He has four complete years wherein to do this. If he has properly availed himself in due order of such arrangements he will find his work easier than it would be otherwise and he will bring a stronger mental grip and a fuller intelligence to bear on it. Your lines are certainly well laid in this place for a curriculum such as this.

I pass on to remark in respect of hospital training that while we are justly proud of our new hospitals which secure for the sick all that modern knowledge has supplied in the way of comfort, safety, and skilled nursing, it must be admitted that in some of them we have barely kept pace with the developments in clinical teaching which are now recognised as necessary. The best clinical teachers in England are, as a rule, the busiest men in the profession, and their chairs being unendowed it is possible for the allurements of private practice to weaken their assiduity in this branch of their work. It is not sufficiently realised that in many instances they are actually contributing largely to the education of their pupils, or foregoing even the small payments they might receive in order to secure better equipments for teaching them. Where, I ask, is anything like this carried out in respect of any of the other professions? I reply at once—nowhere. Let me then propound the remedy for this sorry state of matters. Our university clinical chairs should be endowed, and well endowed, to enable the fittest men to hold them and to devote more time and energy to this work. We find no particular modesty on the part of physiologists and pathologists when they seek for adequate endowments, and therefore those who direct clinical training must not longer remain averse from pleading for appropriate support to promote the best clinical work in any institutions which are as yet defective in this respect. It has been recently asked: "Do our hospital benefactors ever remember that they contribute nothing towards the support of scholars who are perpetually seeking and finding new means of alleviating or preventing the miseries which render hospitals necessary."[1] Bedside work in our hospitals needs some of the munificence of the wealthy to furnish both teachers and students with the best equipments wherewith to make progress. The hospital schools of medicine should henceforth be devoted entirely to the study of disease and the successful treatment of it and no part of the energy of their staff should be expended on the teaching of ancillary subjects. You have wisely settled this arrangement here, and we look hopefully for similar provisions elsewhere in the immediate future.

I note that objections have been raised to the representation of this University on the General Medical Council of the United Kingdom, chiefly on the ground that there are already too many university representatives on that body. In my opinion the Council has become unnecessarily large, but so long as its present constitution remains unaltered I can conceive of no more worthy institutions than the universities to elect the members of it. I feel confident, therefore, that you will not fail to secure a seat on that Council for a representative from this University.

In addresses of this kind it is customary to unfold the long array of studies which lie before you and to urge you to excellence in all of them. Such a proceeding is no longer necessary and I shall not follow it. Neither shall I repeat the well-worn platitudes respecting the nobility of the profession you have chosen or the prospects of hard servitude in it, with an assured moderate competence and a full measure of self-respect as a set off against the ingratitude and unconscionable exactions of the public; but I will try instead to raise your thoughts very briefly to-day to two aspects of our work which appear worthy of consideration and likely to prove helpful and encouraging.

You have perhaps observed that the tone of my remarks thus far has been reverential in respect of those of our fellow citizens who, either by way of intellectual gifts, personal service, or princely munificence, have at last secured for this mercantile centre the dignity and educational privileges of a complete university. And I have no less assumed a hopeful tone in my anticipations of the future which lies before you, and those who will follow you, in regard to these new provisions. Extending those two mental moods and applying them more particularly to our meeting to-day, I propose to take for my text the subjects of Reverence and Hopefulness in Medicine. And first in regard to reverence. A distinction must be drawn between reverence and veneration and, again, between it and awe. Truly, there are awful things in medicine, but we, at all events, may never stand in awe of them in any

[1] Dr. S. J. Gee, Lecture on Abraham Cowley, St. Bartholomew's Hospital Journal, July, 1903, p. 150.

but a reverent manner, one void of any feelings of dread. The reverence I have now in my mind relates rather to the great men who have preceded us in our calling, and to the work and influences they have left as our heritage. A habit of reverence is, indeed, everywhere becoming, but I venture to think it is less manifested in these days than was formerly the case. An absence of reverence may be safely regarded as a symptom of decadence in manners. The spread of democracy and an extension of education need not necessarily entail bad manners, or even any lapse from the better ones of the past, but those who have reached my time of life can testify to a somewhat prevalent spirit of irreverence and a tendency to a laxity of manners and conduct which was certainly less marked in our earlier years. Such conduct, if not immoral, is at least significant of bad breeding. Good manners never savour, as it is sometimes supposed they do, of servility. With Kingsley, I will say that "reverence for age is a fair test of the vigour of youth and, conversely, insolence towards the old and the past, whether in individuals or nations, is a sign rather of weakness than of strength," and I will add no more on this aspect of my subject.

In speaking of reverence as due to the great men who have enriched our profession in the past I am not unmindful of the mental habit which prevailed especially in the seventeenth and eighteenth centuries when physicians reposed so blindly upon tradition and were held in bondage by it; but it may be questioned whether the experimental methods which subsequently broke these fetters are not answerable for some negligence in regard to a study of the thoughts and characters of many of the great masters in medicine. This is an age of active experimentation and research and there is a tendency in such studies to engross the observer so fully with his own speculation and results that he is apt sometimes to overlook, or even to disregard, the conceptions and work of those who have tried in former days to seek out truth. The marvellous aids with which modern science has furnished the investigator of to-day are apt to make him forget the slender equipment which was available for his predecessors and the difficulties of the problems which then faced them. He thus fails to realise the value and intensity of the mental acumen which alone carried them to such revelations as they made. It was doubtless imperative for John Hunter in his day to say "do not think, but try," but I venture to believe that now we may do well to think a little more and, perhaps, to try a little less, for, indeed, original research demands thought and no little calm meditation. The present tendency in the laboratory is to secure prompt results, and so we have many such laid before us, some of which, achieved in the absence of due meditation, are either immature or profitless.

The history of medicine has been too little taught and studied in England and some measure of the failure to render due reverence to the work of the past is probably due to ignorance of it. We therefore gladly welcome the recent foundation of the FitzPatrick lectureship on this subject in the Royal College of Physicians of London, which has removed a reproach too long merited in this country and earned great credit for its instigator, Dr Norman Moore. It is seemly that the names and achievements of those who have successively built up the foundation and fabric of all that is true and certain in medicine should be known and regarded with reverence, and in particular that we should learn when we can what manner of men they were who did this, for assuredly there is a reverence due no less to the characters than to the accomplishments of men, and our reverence should reach to veneration when we find both of these nobly blended in any individual. It is doubtless less easy to feel reverence for the best and ablest men we have known and for those who have lived in more recent periods than for the great luminaries of past centuries, but we have to judge them all by their work, by their power of unlocking the secrets of nature, and by the evidence we have as to their personal qualities. Not seldom, in the absence of history, a man's achievements may afford a clue to his character. We may know little as to the personality of Hippocrates, Dioscorides, Aretæus, or Galen, but we feel sure that they possessed the full instincts of our art and in each case a *mens medica*. In later days we have the materials for forming opinions as to what manner of men Vesalius, Morgagni, Ambroise Paré, Boërhaave, Scarpa, and many other gifted ones of our calling were. I urge you to learn something of such men and call on you to praise and to reverence them, and further, not to rest content with the mere knowledge of their names as you meet with them in the course of your reading but by some study to realise the quality of their work in relation to the age in which they lived. You will gain much from such efforts. At a still later period, the lives and work of Harvey, Sydenham, and Glisson should enlist your interest, while the commentaries of Heberden, the lives and researches of John Hunter, Matthew Baillie, Laennec, Bright, Graves, Addison, and others should awaken in you a fervid enthusiasm for your profession. Put away at once the idea that nothing is to be learned from a study of the old medical masters, that their work is effete, and little of it fit to bear the light of this twentieth century, but rather accept the opinion of Samuel Johnson who affirmed that "if no use be made of the labours of past ages the world must remain always in the infancy of knowledge; if every man were to depend upon his own unassisted observation for his knowledge of disease, every man would be marvellously ignorant, and the science of medicine would stand still, or cease to be."

I venture to suggest that in all examinations for the Doctorate in Medicine some part should relate to the history of medicine. This subject could hardly be dealt with in any previous examinations. Such studies as I have just urged will certainly tend to show you which way genius lies, and you will come to agree with Kingsley who declared that he had no respect for genius where there was neither strength nor steadiness of character to support it. Let me add to all this and inculcate the reverence that is everywhere due to the body of man in life or in death, whether in your daily intercourse in the world or in your relations with the sick, and especially in your studies in anatomy and pathology In few vocations are men more compelled to revere and to respect our common humanity than in ours, and we are never permitted to forget that our bodies, whether in vigour or in decay and repulsiveness, are designed to be temples of the Holy Ghost.

I pass on to my second point, that of hopefulness in medicine. This period in the lives of most of you is truly one in which hope is a prominent feature, one in which little or nothing appears to blight or to darken it. If you are not inspired by hope now you never will be. Cherish that gift now and always. You will be wise not to look too far ahead in your lives but to take each day's work as it comes and to make the best of it. Let your hopes, with an accompanying ambition, lead you to high aims at the beginning of your career, for "the realm of the possible was given to men to hope and not to fear in," and as Dr. Currie said, and Liverpool should ever venerate his memory, "no man can tell whither fortune and merit may lead him."

The present condition of our profession at home and throughout the empire is, I think, better fitted to inspire hopefulness for the future than has ever been the case. The entrance to it is better guarded now than formerly and fewer men, though of higher attainments, are enrolled in its ranks. There must therefore be a larger and more remunerative field of usefulness before you. The fuller comprehension of disease and the improved methods of treatment for the sick should prove a source of satisfaction to all who enter the profession to-day, while the disclosures which await prudent research in competent hands and the fresh application of them may well inspire all of us with greater hopefulness for the future. We look forward, for instance, with good hope to the investigations now in progress respecting the nature and origin of cancer, that ghastliest of maladies, and especially because they are being conducted on wide and most searching lines and are in the hands of men who are entirely competent to deal with so difficult a problem. With the discovery of the origin of cancer we may fairly hope to find the means for the prevention of it. The study of malaria on such lines has already proved fruitful in this direction and no small part of the credit of this success is due to the labours of our countrymen Sir Patrick Manson, and to your distinguished professor, Major R. Ross, whom we are proud to have trained at St. Bartholomew's Hospital. The School of Tropical Medicine in this city, so well inspired by Sir Alfred Jones, is taking an active part in enlarging the knowledge of those grave maladies which so sadly disable and kill our brethren in various parts of the empire and we take this work as an earnest of further achievements here, for no better centre for directing it exists anywhere in the three kingdoms.

I speak next of hopefulness in the conduct of diseases as a

necessary equipment of all who practise our art. We have, and always have had, optimists and pessimists in medicine. I commend neither mood, for it is certain that each may be the outcome of ignorance or inexperience. While nothing is more damaging to a man's reputation than an unfulfilled evil prognosis, it fares badly with him who, not having recognised indications of danger, has consequently raised false hopes; yet there is a measure of hopefulness which is always becoming in our duties, which is potent to inspire action and to secure the highest efforts of all engaged in the service of the sick. Those whose studies lie mainly in morbid anatomy and pathological processes may naturally be disposed to pessimism in medicine. We who study disease in our fellow creatures are more inclined to hopefulness, for we, happily, can often recognise a residuum of recuperative power in the body and its organs which, though gravely disturbed, are yet capable of restoration to normal, or at least adequate, functions. Such hopefulness should be carried to the bedside of the patient, and its power is not small, both in reinforcing remedial agents and in promoting recovery. With it lies much of the personal influence exerted by those who succeed well in practice and the absence of it sometimes explains the failure of others, often able and accomplished, to impress or to inspire their patients. Do not imagine for a moment that in thus urging a rational and wholesome degree of hopefulness in our professional conduct I am approaching the subject of that pestilent nonsense called "faith healing," which in these days of widely spread religious indifference is captivating many silly people. I am much mistaken if Lancashire wits and common sense pay any heed to this American importation. It is truly deplorable to find that the sacred name of Christian is claimed for this method by persons whose education ought to be a safeguard against such preposterous folly. Perhaps the explanation may be found in the sage remark of John Hunter that "everything new carries a greater weight and makes a deeper impression on a weak mind." We shall do better to take to heart the words of Peter Mere Latham: "Medicine, as it begins to touch upon higher interests, even the interests of life and death, should feel itself in alliance with higher motives than any which can be thought to help and quicken its pursuit as a mere science. Medicine claims a sort of moral respect in the handling; it calls upon the conscience as well as the intellect for more caution to avoid error, and more fearfulness of overstepping the truth."

We may never omit to recognise the humanity of our profession, to pay reverence to the sick, and to cherish hopefulness in the relief of their despondency and sufferings.

Let me commend to you lastly some thoughts of distinguished men who attained excellence in their several spheres of work. Sir Joshua Reynolds declared that "those who were determined to excel must go to their work whether willing or unwilling, morning, noon, and night, and they will find it be no play but, on the contrary, very hard labour." For students of medicine each day's work must be done on that day. Time lost at the outset—and this is not an uncommon occurrence—is never recovered and a full measure of work must be prudently combined with the necessary relaxation and recreation of the body. "In the medical profession," wrote Dr. Addison, "all truly valuable and practical knowledge is to be attained by a proportionate sacrifice of time and labour, and, as a general rule, the one may fairly be measured by the other." Dr. Gooch remarked that "if the object of the student is to learn only what has been *said* on a subject the pursuit of knowledge is an easy task, but if his object is to learn what is *true* on a subject the pursuit of knowledge is the task of a lifetime." As students you must know well some of your books, but you must no less come face to face with the facts you read about. You must see, handle, and arrive as far as possible at the real inwardness of all that is laid before you. Bacon has told us that "some books are to be tasted, others chewed and digested." Let all your knowledge be first-hand, of a quality, that is, which will at once ingratiate any examiners you may have to encounter. As you learn to study now so will you go on in after life, for we are all students to the end of our career. If your foundation is not now widely and firmly laid you can look for no worthy superstructure hereafter, for Bishop Berkeley has told us that "he who would make a real progress in knowledge must dedicate his age as well as his youth, the later growths as well as first-fruits at the altar of truth." And, happily, not seldom do we find fruitful work in our profession coming from men who have surpassed even the ordinary span of life and yet have maintained their mental activity and enthusiasm after years of labour. Never be afraid of hard work, for it is the savour of life and the best of mental antiseptics, and, as Sir James Paget once said, "learn to believe in the consequences of it." Yet again, do not be downcast if your measure of ability is small, for it can be mightily reinforced by perseverance and assiduity. Let such as are diffident in this respect ever be inspired by this apophthegm: "*Maximum mediocria ingenii adjumentum diligentia.*"

Some of you will not fail in due time to enlarge your experience at other schools in this country and abroad. It is always profitable to continue study under new teachers, and not seldom is it a source of life-long happiness to make friends amongst those who have been educated elsewhere. The metropolis of the empire presents a field of clinical opportunities which surpasses even the wealth of material to be found in this or any other great centre, while Paris, Berlin, and Baltimore afford attractions to all who are able and ambitious to add to their professional knowledge. In this city you are not without great advantages both for work and recreation. The environments of this College may not be exactly uplifting or inspiring to-day, but we may believe that they were more so a century ago if we read the verses of a native whose affection for the town was certainly greater than his poetic power, for Mr. William Colquitt, a bachelor of arts of Christ's College, Cambridge, and a member of a family well known here at that time, thus expressed himself[2]:—

> "The Infirmary extensive is compleat,
> The rooms commodious, the assistance great:
> Here are green trees and walks 'midst herbs and flowers
> To reconcile the patients' restless hours.
>
> The public walks upon Mount Pleasant made
> Are set with verdant trees and flowers to shade;
> These rural bowers and prospects form a screen,
> Delightful in a summer's day serene."

Alas, these rural bowers and verdant trees no longer existed, even in my earliest days here; yet under the enlightened spirit of a modern civic corporation may we not hope and live to see such trees and walks as Colquitt described restored to this vicinity and to other parts of this city? Even now within easy reach you can enjoy the purest air and follow, or even compete with, some of your professors in prosecuting games and athletics and so maintaining your health. From this day onward, and throughout your careers in the profession, chequered as these surely will be, let me urge you, in the solemn and beautiful words of Sir Thomas Watson, to remember that "in your most successful efforts you are but the honoured instruments of a superior power." The motto of our dear old city, too, must not fail to rise sometimes in gratitude to your lips, "*Deus nobis hæc otia fecit*," and then you may go on your way with a light heart, for—

> "Hope shall brighten days to come,
> And Mem'ry gild the past."[3]

Gentlemen, I wish for the future of all of you every success and happiness; that you may do credit to this faculty and show to the world what manner of men the new University of Liverpool can introduce to our profession.

[2] Poems, Chester. 1802. [3] Moore.

JOHANNESBURG HOSPITAL.—The report of the Johannesburg Hospital for the year ended Dec. 31st, 1902, shows that the total number of indoor and outdoor patients, paying and free, treated during that period was 9968, of whom 6120 were outdoor patients. Of the 3868 indoor patients 2477 were white and 1391 coloured, and of these 1956 paid full hospital fees, 180 only a portion of the fees, and 1732 were treated gratuitously. Among the 2477 white patients there were 247 deaths—i.e., 9·95 per cent.; and among the 1391 coloured patients there were 283 deaths—i.e., 20·3 per cent. The hospital is equipped to accommodate 232 white and 66 coloured patients. The daily average number of beds occupied during the year was 253, but during the last three months of the year the average daily number rose to 310 and tents had to be used for the reception of natives. During the recent war there was an interruption in the publication of these annual reports. The actual revenue received in the course of the year was £33,102, made up of hospital fees (£16,884) and Government grant (£16,218); the expenditure for the year was £36,391. Mr. H. Ireson Feirce, the resident medical officer, in his report refers to the prevalence of enteric fever, pulmonary tuberculosis, miners' phthisis, and scurvy.

Abstracts
OF
INTRODUCTORY ADDRESSES, ETC.,
DELIVERED AT THE
MEDICAL SCHOOLS
AT THE
Opening of the Session 1903-04.

LONDON (ROYAL FREE HOSPITAL) SCHOOL OF MEDICINE FOR WOMEN.

INTRODUCTORY ADDRESS BY ELIZABETH M. FACE, M.D. LOND.

My first and pleasant duty is to bid you all most heartily welcome to this school where I spent so many happy hours myself. I most warmly congratulate you on your choice of a school and hope that you will enjoy your work here as much as I did. I should like to give you a short sketch of the history of this school and of others for women which have sprung up since. You will see how much we owe to the men and women who gave ungrudgingly their time and energy in the founding of this school and how much lies with you to carry on the traditions of the first students here. We can hardly realise what energy and perseverance were needed to work under the conditions they had and we must take care that the fact of getting easily what they had to fight for does not make us value it the less.

The history of medical women in Great Britain begins nearly 60 years ago, when Dr. Elizabeth Blackwell took her degree in America and she was the first medical woman on the British Register. She was followed in 1865 by Mrs. Garrett Anderson who had many difficulties to overcome, but who obtained a medical qualification from the Society of Apothecaries after very considerable personal trouble and pecuniary outlay. The fact of Mrs. Garrett Anderson being followed by other women anxious to tread in her footsteps alarmed some members of the medical profession and the agitation raised ended in the examination of the Society of Apothecaries being shut to women. As it had been the only one which admitted them this was very serious and it was after this that the students who had hoped to obtain their qualifications in London went to Edinburgh and attempted to get both their medical education and degrees in the University there. Allowed at first to matriculate and to take their students' tickets, difficulties arose over the teaching. The professors not being obliged to teach women students some of them refused. After four years of effort to get matters put on as fair a footing for women as for men it was found to be hopeless and the students left Edinburgh. These women came back to London and with the help of Mrs. Garrett Anderson, who was then practising in London, and with the enthusiastic support of sympathisers, both medical and non-professional, the little medical school in Handel-street was opened in October, 1874. It had 23 students. A provisional council of 24 influential medical men was formed and Dr. Anstie was appointed the first dean. A staff was appointed, consisting of lecturers who held similar posts at other schools. Three years passed before clinical teaching could be obtained for the Handel-street students, but in 1877 the Royal Free Hospital opened its doors to women students. Their number rose to 34 and the school showed increasing prosperity. Till 1876 no legal qualifications to practise medicine could be obtained by women, but after Mr. Russell Gurney's Bill, enabling all British licensing bodies to give diplomas to women, was passed the Royal College of Physicians of Ireland consented to examine them, and several women passed its examination. In 1878 the University of London admitted women to degrees in all subjects, and the London University medical degree has always been the one taken by a large proportion of the students of this school. The Scotch universities did not follow the example of London till 14 years later, but with time all the doors by which men may enter the medical profession have been opened to women, with the exception of the Royal Colleges of Physicians of London and Surgeons of England and the medical degrees of Oxford and Cambridge. In 1886 a small medical school for women was started in Edinburgh where Miss Jex Blake was by that time in practice. It did useful work for 12 years, until the changed conditions in Edinburgh, making it possible for women to attend some mixed classes in the University, made it impossible for the little school to compete with a cheaper system of teaching. In 1890 the Medical College for Women now in Minto House was founded and the school has flourished. In the same year a medical school was founded in connexion with the Queen Margaret College, Glasgow. This was later incorporated with the University. The Irish have always proved generous to women students. As I have said, all their degrees are open to us and we are admitted to all their medical schools with the exception of Trinity College, Dublin. There is no need, therefore, for separate schools and none exist. In America the tendency seems to be towards closing of the separate and increase of mixed schools. As for the later history of your own school you know that it has flourished exceedingly. 30 years ago it had 23 students and now the number is 195. The old students, numbering some hundreds, are scattered all over the world, many of them doing valuable work abroad and others at home, proving by their success in hospital and private practice that there is a need, nay, a demand, for our work. The incorporation of the school with the Royal Free Hospital and the recognition of the London (Royal Free Hospital) School of Medicine for Women as one of the constituent schools of the University of London have been the two latest developments in its growth. You have now a means of medical education as different from those of 30 years ago as the spacious buildings and excellent lecture-rooms are from the little house in Handel-street, now so completely transformed. This we owe to the friends who helped the school through its early days, to the friends who never wavered in their determination to gain for all the right to work at what they most care for. We cannot give them better reward than to let them see younger generations of medical women devoting themselves heart and soul to the profession that they, by their efforts, have made possible.

SCHOOL OF PHARMACY OF THE PHARMACEUTICAL SOCIETY.

INTRODUCTORY ADDRESS BY JOSEPH W. SWAN, F.R.S.

Dr. Swan congratulated the students on the excellent opportunity which the school afforded them for the scientific study and practice of pharmacy. He could not help contrasting the position of British pharmacy to-day with the inferior position it occupied at the time of his first contact with it 60 years ago. The institution by the Pharmaceutical Society of the School of Pharmacy had contributed towards the improvement of the scientific education of the pharmacist; his reputation could rest on no better foundation than superior technical and scientific knowledge. The educational progress of pharmacy under the auspices of the Pharmaceutical Society had been a happy exception to the rule of our general educational want of progress. The events of the last 60 years illustrated in a remarkable manner the enormous advantages of education. They showed conclusively that our want of thoroughness in education and the consequent want of imagination and capacity to appreciate the value of scientific research had caused us immense national loss. The period (exactly covered by the work of the school) had been without parallel for its industrial and economic results and superficially regarded they seemed to falsify the contention of the beneficial effects of education; for 60 years ago we were an unlettered race, a large percentage of the population being unable to read or to write. But it must be remembered that we had had many accidental compensations which for a time had neutralised and hidden the educational weakness of our position. At the outset we had the good fortune to have among us a number of men of genius who by their inventions and their enterprise in connexion with the extended use of steam power for manufactures, railways, and iron steamships, had with the help of our abundant coal raised Great Britain to the highest pitch of industrial prosperity. These great results of British invention and enterprise had been obtained before the influences of education in the creation of rivalry and competition were felt as they are now. All the advantages of our initiative were exhausted, our industrial rivals were now armed with our own weapons, and they had added to their effectiveness the enormous force of superior education in their use. We were now menaced by the imminent danger of industrial ruin unless at this late hour we repaired the fault of our former and continued neglect by immediately taking the necessary steps to put our house in educational

order. Sir Norman Lockyer had recently stated that the cost would be heavy, but the cost of education when carried out in the most liberal manner, if even lavishly carried out, was as nothing in comparison with the benefits it was capable of conferring through the improvement of our industrial position. He was glad to see that a somewhat higher standard of preliminary general education was being demanded of the students before admission to the minor examination. He hoped that they would not only study to pass examinations but for the love of knowledge. If looked at in the right way they would discover that their work contained within itself the elements of refined pleasure. In conclusion, he reminded the students that they were more than prospective members of an honourable calling, that they were actual members of a great community that, measured by the greatness of its achievements and by the force it exerted in bringing about those social and industrial changes identified with civilisation, was the greatest in the world.

THE SURGICAL TREATMENT OF INTESTINAL PERFORATION IN TYPHOID FEVER.[1]

BY DONALD ARMOUR, M.B., M.R.C.P. LOND., F.R.C.S. ENG.,

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IT needs no apology from me for bringing before your society for discussion such an important subject as the surgical treatment of intestinal perforation in typhoid fever—a subject of the deepest interest not only to those inclined towards either the purely medical or surgical side of our profession, but also to those who may intend to regard it from the broader standpoint of the general practitioner.

Of all the complications of typhoid fever perforation is the most surely fatal and the one in which surgical interference alone, if we except a very small number of cases of localised peritonitis and abscess, can afford any relief. For the evidence of recovery from perforation in typhoid fever consists almost exclusively in the reports of cases of recovery from peritonitis following so-called symptoms of perforation of the intestine. The so-called symptoms of perforation merely indicate the beginning of peritonitis and may be the result of other local causes than perforation of the bowel. Of such causes may be mentioned softened infarctions of the spleen, perforation of the gall-bladder, rupture of the spleen, rupture of the softened mesenteric glands, abscess of the liver, and salpingitis. Again, numerous fatal cases of peritonitis in typhoid fever have been reported in which no cause for the peritonitis was found. One of the earliest of these was published by Jenner in 1850.[2] Moreover, perforations of the intestine occasionally occur, simulating very strongly typhoid perforation, in which the bacillus typhosus cannot be demonstrated. Cushing[3] has observed such a case. The patient, a male, aged 26 years, entered the hospital complaining of severe abdominal distress of 12 hours' duration. He had all the symptoms of a general peritonitis and at the operation a single perforation was found in the ileum two centimetres in diameter and about 30 centimetres from the ileo-cæcal valve. He died six hours later and the necropsy showed an acute splenic tumour, parenchymatous degeneration of the kidneys and liver, with no other intestinal lesions characteristic of typhoid fever. There were no focal necroses in the liver and the bacillus typhosus was nowhere obtained in cultures. After discussing such cases reported as being recoveries from perforation in typhoid fever Fitz[4] sums up the question in the following words: "Since perforation of the intestine in typhoid fever may take place without any suggestive symptoms, and since suggestive—even so-called characteristic—symptoms may occur without any perforation having taken place, it must be admitted that recovery from such symptoms is no satisfactory evidence of recovery from perforation."

Granted, then, that though recovery without treatment from intestinal perforation in typhoid fever may be devoutly hoped for yet is never to be expected, it behoves us to consider how by active interference we can reduce its death rate and by what means we can bring this most fatal accident into line with modern surgical methods and place it upon a sound basis of treatment.

Historical.—It is of interest to recall that as early as 1762 Richter, in Vienna, first suggested opening and draining the peritoneal cavity in cases of general suppurative peritonitis. Again in 1816 van Vrecken, in Paris, repeated the suggestion.

Yet 60 years later, in 1876, Kaiser, in Freiburg, was only able to collect 15 cases operated upon up to that time; and of these most were instances of localised peritonitis in women. Von Leyden in 1884 read a paper in Berlin before the Association for Internal Medicine in which he referred to the very unsatisfactory results of the medical treatment and drew general attention to the question whether or not it was possible to treat peritonitis by operation. This was followed a little later in the same year by an exhaustive article by Mikulicz, reviewing the cases operated upon up to that date and reporting one of his own supposed to be due to a perforated typhoid ulcer. In this paper Mikulicz advocated surgical intervention for perforation in typhoid fever in the following words: "If suspicious of a perforation we should not wait for an exact diagnosis and for peritonitis to develop to a marked degree, but on the contrary one should immediately proceed to an exploratory operation, which in any case is free from danger." And finally Wilson of Philadelphia in 1886 foretold our present position in the following impressive words: "The objections which may be urged against laparotomy in intestinal perforation in enteric fever are no more forcible than those which would have been made use of at first against the same operation in gunshot wounds of the abdomen. *The courage to perform it will come of the knowledge that the only alternative is the patient's death.*"

Such appeals were soon to bear fruit, for in 1887 the first operation for the relief of symptoms due to a perforating typhoid ulcer was performed by Kussmaul for Lücke of Strasburg. The symptoms developed on the eighteenth day and the operation was performed 12 hours after their onset. The edges of the ulcer were excised and the opening in the bowel was sutured. Death occurred in a few hours. In the same year and without any knowledge of previous operations of the kind Bontecou of Troy, New York, operated upon a case 36 hours after the onset of symptoms of perforation which occurred in the third week. The patient died without recovering from the anæsthetic. It is of interest to note that in this case the appendix was ulcerated and perforated, as well as the ileum ten inches from the ileo-cæcal valve. In the same year (1887) Bartleet of Birmingham also operated without success. Whether this was a case of perforation or not is doubtful. No perforation was found and while Finney accepts it Fitz rejects it from his compilation.

The first successful case that I can find in Finney's analytical summary[5] was performed by Wagner in 1889. The patient was a female and the perforation occurred during convalescence. Since then operations have been performed in increasing numbers and with gradually better results. Finney[6] was able to collect in 1899 112 cases of laparotomy for perforative peritonitis in typhoid fever, and Keen[7] a few months later was able to add 38 more, bringing the total number up to 150. Since then cases are continually being reported from all parts of the world with ever-improving results. So that we are now bound to regard the procedure as one of sound surgery.

Statistics.—Murchison estimated that the mortality of typhoid perforation in general is about 90 per cent., and in those cases in which general peritonitis supervenes after such perforation that it is 95 per cent. The duration of life after symptoms of perforation arise is usually very short. Fitz,[8] basing his records on 134 cases, found 37·3 per cent. died on the first day, 29·5 per cent. on the second day, and 83·4 per cent. during the first week.

Concerning the frequency of perforation Schulz found that it took place in 1·2 per cent. of 3686 cases of typhoid fever in the Hamburg hospitals in 1886-87. Liebermeister found it in 1·3 per cent. of rather more than 2000 cases in hospital

[1] A paper read before the Medical Society, University College, London.
[2] Medical Times, vol. xxii., p. 405.
[3] Johns Hopkins Hospital Reports, vol. viii., 1900.
[4] Transactions of the Association of American Physicians, vol. vi., 1891.
[5] Johns Hopkins Hospital Reports, vol. viii., 1900.
[6] Loc. cit.
[7] Philadelphia Medical Journal, Nov. 4th, 1899.
[8] Loc. cit.

at Basle from 1865 to 1872. Hölscher gives 6 per cent. in 2000 cases. Murchison found 11·38 per cent. in 1721 cases collected from various sources. Fitz in 4680 cases gives 6·58 per cent. Hare gives 20 per cent. and Gesselewitsch and Wanach give 10 per cent. Osler says from 7 to 14 per cent. of typhoid fever patients die, Johns Hopkins Hospital in ten years having a mortality of 63 out of 829 cases, or 7·5 per cent. Of the deaths in typhoid fever Osler says that 50 per cent. are from asthenia, 25 per cent. are from perforation, and 25 per cent. are from hæmorrhage and other accidents. Finney, from a compilation of statistics from various of the best authors, says that perforation occurs in from 1 to 2 per cent. of all cases of typhoid fever. Armstrong [9] places it at from 2 to 5 per cent. of all cases. Of 932 cases treated in the Montreal General Hospital in the last six years perforation of the ileum occurred in 34 cases or 3¾ per cent. Hunter,[10] in an analysis of the cause of death in 50 cases of typhoid fever, says that 48 per cent. died from perforation. In the Maidstone epidemic of 1897 of 210 cases death occurred in ten, or 4·76 per cent. Out of these 210 cases three patients died from perforation, which gives a rate of 1·42 per cent. of all cases, or 30 per cent. of the fatal cases. Taking the Metropolitan Asylums Board reports for the last nine years I find the following percentages of perforation :—

Year.	No. of cases.	Perforation.	Average incidence.
1895	544	25	4·22 per cent.
1894	534	17	3·18 ,, ,,
1896	661	20	3·02 ,, ,,
1896	611	30	4·9 ,, ,,
1897	666	21	3·10 ,, ,,
1898	744	35	4·7 ,, ,,
1899	1383	50	3·6 ,, ,,
1900	1749	46	2·63 ,, ,,
1901	1336	37	2·77 ,, ,,

This gives an average incidence varying between 2·63 and 4·9 per cent. According to Goodall and Washbourn, out of 506 cases at the Eastern Fever Hospital perforation occurred in 16 cases, or 3·1 per cent., so that under modern methods of treatment and good nursing the percentage of perforation may be said to range from 1 to 5.

Sex and age.—Perforation occurs much more often in men than in women. Finney gives the ratio as 3 to 1. Out of 444 cases referred to by Fitz 71 per cent. are among men and 29 per cent are among women. It is very rare in children. Wolberg found no case of perforation among 277 cases of typhoid fever in children in the Warsaw Hospital. In an analysis of 71 cases of typhoid fever treated in the Children's Hospital of Philadelphia during 1901 by Hand and Walker [11] no case of perforation occurs. Shattuck, Warren, and Cobb [12] have been able to find but four cases of operation for perforation in children under 12 years of age. One of these is that of a boy, aged nine years, upon whom Cushing performed three laparotomies, with recovery.

The following table taken from Fitz's paper shows the age at which perforation most frequently occurs :—

Age.	Cases.	Per cent.
1 to 10 years	7	3·6
10 ,, 20 ,, ...	46	23·8
20 ,, 30 ,, ...	77	39·8
30 ,, 40 ,, ...	45	23·3
40 ,, 50 ,, ...	14	7·2
50 ,, 60 ,, ...	2	1·0
60 ,, 70 ,, ...	1	0·5
Total	192	-

In other words of 192 cases over one-third occur in the third decade.

Time of perforation.—Perforation may occur at any period during an attack or during a relapse. The longest reported time after the onset of the disease is Bogart's case [13] the perforation occurring during a second relapse in the fourth month. The shortest is that in a case reported by Ferrarisi [14] quoted by Finney, in which perforation occurred on the fourth day. In Fitz's table nearly one-half were during the third and fourth weeks. In Finney's table of 79 cases, in 36 cases the perforation occurred during the third week, in 20 during the second week, and in nine during the fourth week. A review of all the cases in which the date of perforation is mentioned shows that the third week of the disease is by far the most frequent time during which perforation takes place.

Seat of perforation.—In Fitz's 167 cases the perforation was in the ileum in 136, or 81·4 per cent. ; in the large intestine in 20, or 12·9 per cent. ; in the vermiform appendix in five, or less than 3 per cent. ; in Meckel's diverticulum in four ; and in the jejunum in two. In Hawkins's 72 cases referred to by Keen [15] the perforation occurred in the ileum in 61, in the cæcum in three, in the appendix in three, and in the colon in five. Keen [16] adds five more cases from other sources in which the perforation was in the colon, making ten in all, of which two were in the ascending colon, one was in the transverse colon, two were in the descending colon, and five were in the sigmoid flexure. He therefore concludes that if no perforation is found in the ileum, cæcum, or appendix, the next most likely place will be the sigmoid flexure. In Shattuck's 19 cases the ileum was the place of perforation in all of them. Finney says that it occurs in the ileum, usually in the last two feet, in over 80 per cent. of all cases, in the large intestine in more than 12 per cent., and in the vermiform appendix in about 5 per cent. of all cases. It is usually single but may be double—a point to be borne in mind whenever operative procedure is undertaken. The involvement of the appendix in typhoid fever is of extreme interest and will be referred to later.

Character of the perforation.—The aperture is sometimes exceedingly small and rounded, but may be linear if due to laceration. The perforation may occur in ulcers from which the sloughs have separated, or again, in certain cases the gangrenous process extends directly through the whole thickness of the bowel, and then the slough dropping out may leave a hole of considerable size. According to Osler only rarely is the perforation at the bottom of a clean thin-walled ulcer, the majority being in small deep ulcers. If the ulceration is in a solitary follicle, the perforation is apt to be small and round, while if in a Peyer's patch it may be oval or round and will be much larger than in the former case and may even involve one-half of the circumference of the bowel. The opening may be shreddy or clean-cut. Very frequently there is a fairly wide area around the ulcer in which the intestinal wall has been greatly thinned. From an operative point of view this is of great importance.

Symptoms.—There is no pathognomonic sign of perforation nor is there any definite relation between perforation and the severity of the attack. It occurs in mild cases as well as in severe. Such symptoms as are usually described as being indicative of perforation may be entirely absent or remain latent. On the other hand they may be gradual in onset or appear suddenly. "The so-called characteristic symptoms are not invariably present, and when they are they may be so altered or obscured by other conditions that perforation may not even be suspected. The signs upon which most dependence is to be placed are sudden acute pain in the abdomen, with symptoms of collapse, accompanied by an abrupt fall in the temperature, it may be of several degrees. Vomiting is not infrequently present. Various special symptoms have been, from time to time, made much of by writers upon this subject—e.g., the obliteration of liver dulness, the gurgling sound on respiration, hiccough, moveable dulness in the flanks, &c. These, like McBurney's point in appendicitis, are very good signs when present" (Finney).

Cushing [17] calls attention to a "pre-perforative stage," and defines it as "the whole period included between the first involvement of the serosa with the customary formation of adhesions at that point, until these adhesions, which may

[9] Annals of Surgery, 1902.
[10] West London Medico-Chirurgical Society, February, 1903.
[11] American Journal of the Medical Sciences, June, 1902.
[12] Transactions of the Association of American Physicians, 1900.
[13] Annals of Surgery, vol. xxiii., 1896.
[14] Bollettino di Società Lancisiana di Ospedali di Roma, 1896, vol. xv., fasc. 1.
[15] THE LANCET, July 29th, 1893, p. 245.
[16] Surgical Complications and Sequelæ of Typhoid Fever.
[17] Loc. cit., supra.

for a time constitute the floor of the ulcer after the serosa has given way, have themselves become broken down and general extravasation has taken place. This period, as in perforating appendicitis, may last a longer or shorter time and is associated with pain and tenderness and a possible rise in leucocytosis owing to the localised peritonitis.[18] Were it possible to recognise such a "pre-perforative stage" in cases of typhoid fever it is the period in which an operation should be undertaken. For obviously one would then be operating to *prevent* general septic peritonitis and not for its relief, as is the usual procedure in cases of typhoid perforation. It is doubtful, however, whether this stage can be recognised with sufficient clearness to be a positive indication for operation. But if recognised it would certainly justify an exploratory incision under local anæsthesia, a procedure which has been frequently shown to have no untoward effect on the course of the disease.

Unfortunately, the analysis of Shattuck's cases shows that the formation of protecting adhesions in perforation or threatened perforation of the ileum is exceedingly rare. And Monad and van Verts[19] state that adhesions, however slight, almost never occur when the perforation is in the ileum; and, moreover, that peritoneal infection is not always a rapid fulminating affair, but may occur slowly from migration of the bacteria through the necrosed and damaged intestinal coats. Intestinal ulcers certainly may have a pre-perforative stage—i.e., a stage of local peritoneal infection, whether adhesions exist or not. And that general septic peritonitis in typhoid fever arising from threatened intestinal perforation from the necrosed and damaged areas of peritoneum over the base of ulcers is not a very uncommon occurrence has been shown by Gairdner.[20]

Are symptoms ever present then which may be called *warning* symptoms—i.e., symptoms, the advent of which should put the physician on the alert and urge upon him the necessity of calling a surgical *confrère* in consultation? Shattuck from a review of his cases says: "It is rational to conclude that the severe symptoms corresponding to the ordinary text-book picture of intestinal perforation in typhoid were, in the majority of cases, caused by the general septic peritonitis resulting from a perforation or a threatened perforation, the occurrence of which was indicated more or less plainly by symptoms of less severity which antedated the severe or so-called diagnostic symptoms by a definite number of hours." Only five of Shattuck's cases, in which perforation occurred, presented a sudden acute picture of grave abdominal infection *without any premonitory symptoms*. In all the other cases distinct warning symptoms antedated equally distinct severe and diagnostic symptoms. Of Finney's 112 cases, in only nine were the symptoms denoting perforation not marked and of gradual onset. The symptoms most often complained of by the patient are various degrees of abdominal pain and tenderness, either localised or general. A point to be emphasised is that abdominal pain, especially if localised, is not a frequent complaint in mild or moderately severe cases of typhoid fever, unless it means localised or general peritoneal infection, and hence complaints of abdominal pain in such cases should be regarded as serious danger signals. A steadily rising leucocytosis, with localised muscular spasm and tenderness accompanying the pain, are signs of the utmost diagnostic importance. Vomiting is not always present. A rapid drop in temperature is not infrequent and Dieulafoy[20] regards it as almost an infallible sign. On the other hand, many cases are accompanied by a rise in temperature. The pulse becomes small and rapid and stands out in sharp contrast to the drop in temperature if present. The respirations become rapid and shallow and chiefly of the costal type. Gairdner[21] states that rigor as an initial symptom of perforation is uncommon, though Shattuck thinks that if intestinal hæmorrhage can be excluded as its cause it is not irrational to suppose that rigor might be occasionally present as an early symptom.

Concerning the relation of intestinal hæmorrhage to perforation it is obvious that as the former must come through extensive ulceration of the intestinal wall, and since this may mean proximity to the peritoneal coat of the intestine, intestinal hæmorrhage should be regarded in the light of a danger signal of perforation. A close watch should therefore be maintained for signs of beginning peritoneal infection and frequent examinations of the abdomen should be made to detect tenderness or abnormal rigidity, together with repeated blood counts to determine the presence or absence of leucocytosis. Should acute abdominal pain occur with, or follow, intestinal hæmorrhage a grave suspicion of perforation must arise. The most constant symptoms, however, of intestinal perforation in typhoid fever are sudden abdominal pain, increasing in intensity and recurring in paroxysms, general tenderness and rigidity with distension, a rapid, feeble pulse, with signs of collapse and the appearance of leucocytosis.

Leucocytosis.—In discussing the probable value of examinations of the blood in arriving at a diagnosis of intestinal perforation in typhoid fever it is necessary to have some knowledge of the effect that the disease *per se* has upon the leucocytes. Estimating the normal number of colourless corpuscles at about 7500 per cubic millimetre, it has been found that the number throughout an attack of typhoid fever is subnormal. There is a gradual diminution after the first week, the lowest point being reached about the fifth week. After a temporary rise in the sixth, seventh, and eighth weeks there is a tendency to even a further reduction. This temporary rise in these weeks is explained by the fact that at this period the patient is especially open to a variety of secondary infections and intoxications. Again, various transient influences may cause a degree of increase in the number of leucocytes considerably greater than any possible decrease. Thayer[22] concludes from his very accurate and painstaking observations that the number of colourless corpuscles is subnormal throughout the course of typhoid fever, the figures becoming lower with the increase in the duration and intensity of the disease; that the longer and more intense the infection the smaller the number of leucocytes; that the average number of colourless corpuscles at the height of the fever is about 5000, though in individual cases it is common to find as few as 4000 or 3000, while records below 3000 are not unusual; and that with convalescence the number of leucocytes gradually rises, remaining, however, somewhat subnormal during the first several weeks. Thayer definitely refutes the idea held by some observers that an initial leucocytosis occurs during the first week.

Systematic examinations of the leucocytes are now regarded by many surgeons as especially important in connexion with the early detection of perforation, the diminished number of colourless corpuscles during typhoid fever contrasting sharply with the leucocytosis which might be expected with a general peritonitis. The question is how far can leucocytosis be relied upon as a diagnostic sign in favour of a perforation having occurred and what value are we to place on its absence when a perforation is suspected. As to its diagnostic value, it is unquestionably great, more particularly when taken in conjunction with other symptoms already mentioned. Of course, one isolated examination is of no, or of very little, value, though in any doubtful case, if time allows, a count should be made in order to assist in diagnosis. To obtain its full value, however, systematic examination of the blood from the beginning should be made in every case of typhoid fever. In 1897 Cabot noted the fact that leucocytosis in typhoid fever means inflammatory complications in the majority of cases and that it was present in peritoneal infection. He has since pointed out that it does occasionally happen in very exhausted patients that complications fail to produce any leucocytosis, the patient being unable to react against the infection, but that these cases are exceptional. Cushing's conclusions[23] on the subject are of especial value and importance, seeing that they are founded on actual surgical experience. He says: "The appearance of leucocytosis in the course of typhoid fever points toward some inflammatory complication in its early stage. If this complication be a peritonitis and remain localised, associated possibly with a pre-perforative stage of ulceration or with a circumscribed slowly-forming peritonitis after perforation, it may be, and usually is, signalised by an increase of leucocytes in the peripheral circulation. If, however, a general septic peritonitis follow, the leucocytosis may be but transitory and overlooked, as it disappears concomitantly with the great outpouring of leucocytes into the general cavity." Whether absence of leucocytosis in the presence of symptoms of peritonitis

[18] Revue de Chirurgie, 1897.
[19] Glasgow Medical Journal, vol. xlvii.
[20] Bulletin de l'Académie de Médecine, October, 1896.
[21] Loc. cit.
[22] Johns Hopkins Hospital Reports, vols. iv. and viii., 1900.
[23] Johns Hopkins Hospital Reports, loc. cit. supra.

means in every case that general peritonitis has become well advanced has not been actually proved. While a complete knowledge of leucocytosis in the perforation peritonitis of typhoid fever is yet to be reached, still it is certain that careful and frequent blood counts in a typhoid fever patient suffering from abdominal pain may give most valuable evidence of the commencement of peritoneal infection

Diagnosis.—It is of the greatest importance, if surgery is to have a fair chance of saving life, that a diagnosis of infection of the peritoneum should be made within a sufficiently reasonable time from its commencement. And yet the fact that in 11 per cent. of the cases collected by Finney a wrong diagnosis was made shows that the recognition of perforation of the bowel in the course of typhoid fever is not always easy. Appendicitis and intestinal obstruction are the affections for which it is most commonly mistaken. Fitz was the first to call attention to the similarity of the symptoms of perforation in typhoid fever and those of appendicitis. He even goes further and says that they are actually identical, even to the usual localisation of the consequent peritonitis in the right iliac fossa. Dieulafoy [24] describes two distinct forms of typhoid appendicitis, both producing peritonitis. One he calls "peritonitis by propagation," the other "para-appendicitis." In the former the appendix becomes the seat of typhoid lesions, with ulceration, perforation, and peritonitis. The symptoms in this case exactly resemble perforation in other parts of the intestine due to typhoid ulceration. The latter form of appendicitis is a true appendicitis of the usual variety with the ordinary symptoms and possible complications of that disease. Hare [25] also refers to two groups of cases: (1) those cases in which symptoms developing in the neighbourhood of the appendix indicate the rapid development of appendicitis, yet in which these symptoms gradually subside and the patient passes into an attack of typhoid fever; and (2) cases already well advanced in the progress of typhoid fever which develop appendicular symptoms.

Osler thinks that perforation of the appendix in typhoid fever is not very common, as shown by Fitz's 3 per cent. in 167 cases. Cushing, however, thinks it much commoner than is usually supposed and gives 9·6 per cent. from his collected cases. Whether we have to do with a perforation of the appendix or of another part of the bowel in typhoid fever chiefly concerns the question of prognosis, as pointed out by Fitz [26] who remarks: "Clinical evidence, on the contrary, though perhaps misunderstood, is abundant as to the probable frequency of perforative appendicitis in typhoid fever. The probability of its occurrence furnishes the best solution as to the prognosis of intestinal perforation in the latter disease. Most of the cases of recovery from symptoms of perforation of the bowel in typhoid fever are those in which an attack of appendicitis is closely simulated, while the fatal cases of perforation of the bowel in typhoid fever are in a great majority of instances those in which other parts of the bowel than the appendix are the seat of the perforation; hence the prognosis of apparent perforation of the bowel in typhoid fever is to be regarded as the more favourable the more closely the symptoms and course resemble those of an appendicitis." The conclusions arrived at by the Boston Committee, which includes the names of such authorities as Shattuck, Collins Warren, and Cobb, are well worth recording upon this point and are as follows: "It is imperative that we should not be prevailed upon to wait operation in the hope that the perforation may be in the appendix, considering that the chance of localising the infection by delay offers more hope to the patient than speedy operation, because the attack began with right iliac pain and tenderness and muscular spasm. The better teaching is that perforation of the appendix may occur in typhoid, although *rarely;* that when it does occur the infection may be localised, as in any case of perforating appendicitis. But the great majority of cases of perforation of the bowel in typhoid fever may simulate an acute appendicitis."

Prognosis.—In trying to arrive at some definite conclusion concerning the prognosis of the operative treatment of perforation in typhoid fever we are met with the difficulty that two very different and widely separate conditions are considered together in the statisticians' tables—viz., the results of operation for typhoid perforation, and the other the results of operation for general peritonitis following typhoid perforation. In the latter case the prognosis is invariably bad, as shown by the reports of the Metropolitan Fever Hospital for 1901. Ten laparotomies for "perforation in typhoid fever" were performed, none of the patients recovering. But, and this is the important point, all were found at the time of operation "in a state of general septic peritonitis"; so that the operations were really undertaken for the relief of general septic peritonitis and not for the perforation. As in other intra-abdominal catastrophes, so in perforation in typhoid fever, early diagnosis and early operation will greatly improve the prognosis, and in the latter condition, according to Osler, may save from 30 to 40 per cent. of the cases. In Armstrong's cases [27] there were six recoveries in 33 cases, or 18·18 per cent. In ten cases operation was performed during the first 12 hours with four recoveries—i.e., 40 per cent.; in ten cases during the second 12 hours with one recovery—i.e., 10 per cent. Of the 20 cases operated upon in the first 24 hours five patients recovered—i.e., 25 per cent.; of three cases in the third 12 hours all the patients died. Of five of his recoveries the time after the perforation at which operation was performed was 2, 13, 8, 10, and 5 hours respectively. The following table, showing the percentage of recoveries according to the time after perforation at which the operation was performed, is taken from cases collected by Keen [28]:—

—	Died.	Recovered	Percentage of recoveries.			
Under 4 hours ...	6	1	14·3	17·6	10·5	24·06
4 to 8 ,, ...	11	1	8·3			
8 ,, 12 ,, ...	11	4	26·6	31·4	30·1	
12 ,, 18 ,, ...	17	7	29·1			
18 ,, 24 ,, ...	7	4	31·4			
Over 24 ,, ...	38	14	10·0			
Not given	28	11	28·2			
Total	118	34	22·7			

i.e., the recovery-rate for the first four hours is 14·3 per cent.; for from four to eight hours, 8·3 per cent.; and for all cases operated upon within the first eight hours the recovery-rate is 10·5 per cent. In the cases operated upon from 8 to 12 hours the recovery-rate rises to 26·6 per cent., which is below the recovery-rate of operations done from eight to 24 hours, which is 31·1 per cent., or in the second 12 hours, which is 31·4 per cent. After 24 hours the recovery-rate falls to 10 per cent.

The rapid improvement which has taken place in the recovery-rate is well shown by comparing that given by Keen in his book, published in 1898, and in his paper of November, 1899. In the former he collected 83 cases of operation, with 67 deaths and 16 recoveries, the recovery-rate being 19·3 per cent. In the latter he appends 67 additional cases in which there were 49 deaths and 18 recoveries, with a recovery-rate of 26·9 per cent.—i.e., a gain over the recovery-rate of the first 83 cases of almost 40 per cent. The recovery-rate of the whole 150 cases is 22·7 per cent. Up to Jan. 1st, 1900, 11 cases in Osler's wards had been operated upon with five recoveries—i.e., 45·4 per cent. Age, though no barrier to operation, apparently has a considerable influence upon the recovery-rate, as shown by the following table, taken from Keen's paper:—

Age.	Recovered.	Died.	Percentage of recoveries.
Under 15 years	6	6	50·0
From 15 to 25 years	5	34	8·1
,, 26 to 35 ,, ...	10	29	26·5
Over 35 years	6	15	38·5

From this it would appear that between 15 and 25 years is the most unfavourable age at which to operate, whilst the most favourable are over 25 years and especially under 15 years. Sex would also seem to have an influence upon the recovery-rate judging from various statistics. Of Armstrong's cases quoted above 21 males

[24] La Presse Médicale, October 28th, 1896.
[25] Transactions of the Association of American Physicians, 1900.
[26] Loc. cit.
[27] Annals of Surgery, November, 1902.
[28] Philadelphia Medical Journal, November, 1899.

were operated on, and three, or 14¼ per cent., recovered; and nine females, of whom three, or 33⅓ per cent., recovered. In Keen's cases in which the sex was mentioned 102 were males and 19 were females—i.e., 84 per cent. of males. Of the males 83 died and 19 recovered—a recovery-rate of 18·6 per cent. Of the females 11 died and eight recovered—a recovery-rate of 42·1 per cent. In other words, while the number of operations in males has been over five times as many as in females, yet the recovery-rate of females has been over twice that of males. Regarding the recovery-rate in the various weeks of the disease, although the mortality-rate of the second and third weeks is by far the worst yet even these two weeks give a recovery-rate of over 16 per cent. in Keen's cases. As regards results of surgical procedure Osler groups the cases under three classes: (1) those with so much infiltration and necrosis that the gut is not in a fit state for operation and the condition of the patient may contra-indicate any attempt at resection; (2) the operation is successful but the patient dies in the due course of the disease from the intensity of the fever or in a relapse; and (3) those in whom complete recovery takes place.

Concerning the prognosis of the future no one states the case more plainly than does Keen[29] in the following words: "When once physicians are not only on the alert to observe the symptoms of perforation, but when the knowledge that perforation of the bowel can be remedied by surgical means has permeated the profession, so that the instant that perforation takes place the surgeon will be called upon, and if the case be suitable, will operate, we shall find unquestionably a much larger percentage of cures than have thus far been reported."

Treatment.—The only rational treatment of intestinal perforation in typhoid fever is a surgical operation. That this dictum has now finally become accepted is nowhere better shown than in the articles on the subject by such an authority as Goodall in the last three issues of the *Medical Annual*. In that of 1901 no mention of surgical intervention is even hinted at. In that of 1902 we read: "The question is still being debated whether, and if so when, laparotomy should be resorted to." In that of 1903 we find any lingering doubts on the subject dissipated in the following sentences: "There is a pretty general agreement that if perforation occurs surgery does offer the best chance of recovery. ..... I think, further, that there can be no question that the percentage recovery of the cases submitted to operation is *very* much larger than that of those left to themselves. ..... But in spite of our own want of success in the small number of cases I am perfectly sure that as soon as a perforation is diagnosed laparotomy should be performed and it should be undertaken either immediately or as soon as the condition of the patient permits."

In cases of suspected perforation in which it is impossible to arrive at a diagnosis in any other way a small exploratory incision, preferably under local anæsthesia, should be made. Such a procedure has been shown to have no untoward effect on the ultimate course of the disease. It is better to operate needlessly if it so be than to wait for general septic peritonitis to declare itself. There is one very important point, however, in the treatment of cases of suspected perforation upon which too much stress cannot be laid—that is, the administration of opium or morphine. "The use of opium in these cases is justifiable only *after* the diagnosis has been made and operation decided on."[30]

The operation for intestinal perforation in typhoid fever in no way differs in its main features from that undertaken for intraperitoneal perforation from other causes. Three steps follow each other in natural sequence—viz., (1) finding and closing the perforation; (2) emptying and cleansing the peritoneal cavity; and (3) establishing and maintaining proper drainage. Two other points should always be remembered—viz., (1) that there may be more than one perforation present and search should be made for it and for other ulcerations likely to perforate; and (2) that it is necessary to examine the appendix before closing the abdomen as typhoid ulcers sometimes occur there.

As to the time of operation after perforation occurs surgeons differ. Keen advises waiting until the shock, which he ascribes to pain and extravasation, has passed off. Cushing, on the other hand, very aptly points out that while we are waiting extravasation, perhaps of virulent organisms, is continually taking place and hence shock seems hardly a contra-indication to operation. Lennander[31] writing on the subject discourages delay and even regards the anæsthesia and operation as a means of combating shock. The majority of surgeons would now appear to advocate early operation.[32] The position of the abdominal incision (generally in the right iliac region), the form of suture used, the method of cleansing the peritoneum, the question of drainage, the employment of a general or local anæsthetic, all these will be decided by the experience of the individual operator. While resection of the ulcerated portion of the bowel with immediate end-to-end anastomosis would be the ideal operation, it can scarcely ever be feasible. The suturing should be done without paring of the edges—a needless prolonging of the operation—and all of the thinned area should be included in the suture, care being taken, however, to avoid inverting too much, lest too great a narrowing of the lumen take place. Whether the suturing be parallel to the axis of the bowel or at right angles to it, would appear to be immaterial and will be governed by circumstances. Early operation and rapidity of operation, without however sacrificing thoroughness, are the two main essentials for success.

Harley-street, W.

[29] Loc. cit.

[30] Osler in Nothnagel's Encyclopædia of Medicine.

[31] Observations on the Sensibility of the Abdominal Cavity, Mitteilungen aus den Grenzgebieten der Medicin und Chirurgie, March, 1902. Barker's translation.

[32] Armstrong, Finney, Shepherd, Waring, Roughton, Bowlby, and Cushing.

NOTES ON FIVE CASES OF ABDOMINAL SECTION FOR EMERGENCIES DURING PREGNANCY.[1]

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THE following cases are of interest because in all the progress of pregnancy or parturition was complicated by conditions demanding immediate action.

CASE 1. *Porro-Tait operation.*—The patient, a spare woman, aged 24 years, 4 feet 2 inches in height, with no apparent deformity of any of her bones but with a history of rickets in childhood, was seen on March 20th, 1897. She was three years old before she could walk and at the age of 14 years (ten years previously) came under my care suffering from disease of the left hip-joint which confined her to bed for six months. This, however, had left no deformity of the limb. Mr. Moffat Young first saw her at 4 P.M. on March 20th. Labour had begun at 9 A.M. on the same day; the "waters" broke at 3 P.M. but the pains were not severe. As the presenting head made no progress he made a careful examination and found that the lateral diameters of the pelvis were so diminished that he concluded operative interference would be necessary. I met him at 9 P.M. The patient had then been 12 hours in labour and was exhausted. The uterus was firmly contracted but the pains were feeble. Vaginal examination showed the sacro-subpubic conjugate to be apparently normal but the transverse diameter of the pelvis was so much contracted as to admit only two fingers. The head could be felt high above the pelvic brim. It was obvious that the child could not be delivered per vias naturales so the following operation was performed. The patient was chloroformed in bed and when under the anæsthetic was lifted on to the table. Her abdomen was cleansed with soft soap, turpentine, and ether, and purified with 1 in 500 corrosive sublimate lotion. An incision was made in the middle line from the umbilicus to about one inch above the pubes and the peritoneal cavity was opened. The wound being too small to allow of extrusion of the uterus was enlarged upwards with scissors. The uterus was then tilted out of the abdomen and a large sponge was packed behind it over the intestines which were consequently not further exposed during the operation. A piece of drainage-tube was passed round the uterus above the cervix and tightened to form an elastic ligature, care being taken to avoid the bladder. The uterus was then opened close to the fundus by a median longitudinal incision, the fœtus was extracted, the cord was clamped with two pairs of forceps and divided, and the child was handed to a nurse. The

[1] A paper read before the Edinburgh Obstetrical Society on March 11th, 1903.

uterus was next cut away above the elastic ligature, traction being exerted on the tubing whilst this step was proceeding. The ligature was finally tied in a double knot and was transfixed with Tait's pedicle pin immediately below the ligatured stump. The exposed mucous membrane of the cervix was swabbed with pure carbolic acid and dusted with iodoform and boric acid. Douglas's pouch was sponged out and the parietal incision was closed with silk sutures, except where the stump of the uterus was fixed in its lower angle. The wound was dressed with cyanide gauze and wood-wool. The operation occupied less than 25 minutes; the patient did not lose more than half an ounce of blood and when put back to bed looked well.

The subsequent history of the case was as follows. Vomiting was troublesome for 24 hours. The patient's temperature attained its highest point, 99° F., on the first evening after the operation. The stitches were removed on the eighth day. The pedicle separated on the tenth day. The patient was allowed to get up on the twenty-first day. The child was healthy when born, was not breast-fed, and is now alive and well. The uterus with the ovaries and Fallopian tubes was removed. Four years after the operation the abdominal scar was healthy and the patient suffered no inconvenience from it.

CASE 2. *Porro-Tait operation for sarcoma of the pregnant uterus.*—The patient, aged 37 years, was seen with Dr. C. G. Cowie of Hartlepool on July 28th, 1899. She complained of intense pain down the back of her left hip and leg. With regard to her history, she had had two children, the elder being 11 years old and the younger two years and three months. I had attended her in both confinements and delivered with forceps. She last menstruated on Oct. 20th, 1898, and believed herself to be nearly nine months pregnant. About three months previously she began to suffer from paroxysms of pain in the left hip which kept her awake at night and had gradually become more intense and more constant, latterly preventing her from lying down in bed. On July 28th she presented the appearance of a woman who had suffered prolonged pain and she had lost over two stones in weight. The pain had been relieved by nothing but large doses of morphia. On inspection of the abdomen beyond a normal nine months pregnancy nothing was discoverable. On palpation, however, the uterus, instead of being uniformly regular on its surface, had a number of hard nodular masses studded over it. Two especially were large and prominent—one of about the size of a football reaching up under the ribs into the left hypochondrium, the second, flat and moveable, lying immediately above the pubes. On vaginal examination the examining finger, on entering the ostium vaginæ, came upon two thickened cord-like bands running into the posterior fornix along the posterior vaginal wall, like enlarged lymphatic vessels. The cervix was high up behind the pubes and from both fornices nodules could be felt projecting from the uterine wall. The patient was suffering such intense pain and the condition of the uterus was such that normal delivery seemed most improbable, so she was sent into the Hartlepools Hospital for operation on the 29th. Operation was performed at 11 A.M. on the 30th, there being no sign of the onset of labour. An incision, reaching from about one inch above the pubes to about three inches above the umbilicus, was made through the abdominal wall. The uterus was lifted out of the abdomen and sponges were packed in to cover the intestines. The uterus was studded all over with growths and the parietal peritoneum also was sprinkled with smaller deposits. An elastic ligature was fixed round the uterus as low down as possible, tied once, and the two ends were drawn upon to tighten the knot. The uterus was next incised high up in the middle line, close to the fundus, and the child was extracted. The placenta was on the posterior uterine wall and consequently out of the way. The uterus was then amputated above the elastic ligature, the latter was tightened, and a pedicle pin was inserted through the stump. The parietal incision was closed with silk sutures and the usual dressings of cyanide gauze and wood-wool were applied. The operation occupied 35 minutes; the patient soon rallied from its effects and was ordered nutrient enemata of beef-tea (four ounces) and brandy (half an ounce) every three hours. At 6 P.M. a suppository of morphia (half a grain) was given. Her temperature was 100·8° F. and her pulse was 94. On the 31st at 2 A.M. the temperature was 101·6° and the pulse was 84. The patient was in great pain. A suppository of morphia (half a grain) was given. At 10 A.M. she had slept a good deal during the night. She had been sick a little. Her temperature was 102° and her pulse was 92. Five minims of morphia were injected hypodermically. At 10 P.M. the patient had had a comfortable day, with not much pain and no sickness, and had had tea and water arrowroot. Her temperature was 101·6° and her pulse was 86. From this date the patient's recovery was uninterrupted so far as the operation was concerned and the pedicle came away on the fifteenth day. She was, however, losing flesh and strength, and though no fresh growth could be detected the malignant disease was manifestly progressing. The pain in the thigh, which had caused her so much distress, disappeared after the operation. She was discharged from hospital on Oct. 1st, gradually became weaker, and died on Nov. 23rd, 117 days after the operation. The microscopic appearance of the uterus suggested that the growth, which was evidently malignant, might have been previously fibroid. Microscopic examination of a portion of the growth showed it to be a large round-celled sarcoma. The child is alive at the time of writing, healthy and strong.

CASE 3. *Porro-Tait operation for contracted pelvis.*—The patient, aged 22 years, was seen on Oct. 1st, 1902, in consultation with Mr. A. R. McCullagh and Dr. H. W. M. Strover. The history obtained from her on a subsequent visit was that she had always been very delicate and, as far as she and her sister knew, was two and a half years old before she began to walk. Menstruation had been always regular every 21 days, from the age of 13 years, to Dec. 25th, 1901, since when she had seen nothing. The patient was very thin, small, and slightly built; her height was 4 feet 6½ inches. Pains began on Sept. 28th at 11.40 P.M. and continued regularly throughout the night. The "colours" began when the pains commenced. She sent for a medical man on the morning of the 29th. The pains continued throughout the day and the day following but the "waters" did not break till 3 A.M. on Oct. 1st. At that time Mr. McCullagh and Dr. Strover agreed that the child could not be born per vias naturales and sent for me. I saw her at 4 A.M. She was then under chloroform. On examination per vaginam my finger came upon the sacral promontory extending far forward. In front of this could be felt the partially dilated os uteri and the two examining fingers could with difficulty pass between the pubic arch and the sacrum. The pubic arch appeared to be depressed inwards laterally so that a V-shaped space was created. The umbilical cord protruded through the os and was pulsating. The fœtal head could be distinguished high up in the right iliac fossa. As soon as arrangements could be made and the necessary instruments obtained the following operation was performed. The abdomen was cleansed as in the previous cases. An incision was made from about two inches above the umbilicus to within one inch of the pubes. The abdominal wall was so thin that the peritoneal cavity was opened at once. The uterus was next drawn out of the abdomen, flat sponges were packed behind it over the intestines, and an elastic ligature of drainage-tubing was passed round the uterus as low down as possible and tied once. Dr. Strover took charge of this for the purpose of making traction on the ends. The uterus was then incised high up in the middle line in front. The placenta, inserted anteriorly, had to be torn through before the fœtus could be reached and extracted. During this time traction on the elastic ligature prevented any hæmorrhage. The cord was clamped in two places and the child was set free. The uterus was cut away above the ligature and the raw surface was purified and a pedicle pin was inserted through the stump. The upper part of the left broad ligament with the ovarian artery slipped from the bite of the elastic ligature and was tied separately with silk. Douglas's pouch was then mopped dry and the parietal incision was closed with silk sutures. The usual antiseptic dressings of sublimate gauze and wood-wool were applied. The operation occupied 35 minutes from the commencement of washing the abdomen until the patient was put back into bed. Her pulse was good and strong and she showed no signs of shock, although she had been under chloroform four and a half hours when she regained consciousness. She was slightly sick during the day, but retained an egg beaten up in a cup of tea. The catheter was passed every six hours and the vagina was douched with 1 in 2000 corrosive lotion and a wood-wool diaper was applied to the vulva. On Oct. 2nd she had a restless night—dozed but did not sleep. Her temperature was 98·8° F. and her pulse was 86. She passed urine twice and

flatus freely. She had not been sick and had had an egg beaten up in tea. She was ordered water arrowroot, beef-tea, and egg-and-tea; also five grains of calomel. At 9 P.M. her temperature was 97° and her pulse was 102. The bowels had been well moved. On the 3rd her temperature was 98·4° and her pulse was 84. She slept all night and was feeling well and comfortable. She was ordered soda-water and milk. At 8 P.M. her temperature was 98° and her pulse was 84. She had had a good day. On the 4th her temperature was 99·2° and her pulse was 87. She had had a good night but complained of pain in the breasts which were tender and distended. She was ordered one ounce of sulphate of magnesium and liniment of belladonna for the breast. Recovery after this date was uninterrupted. The wound was dressed for the first time on the 10th (ten days after the operation) and was found to be healed. The pedicle had not yet separated. On the 21st the dressings were again removed. The pedicle was separated, leaving a small granulating surface of about the size of a sixpenny-piece. Subsequently I obtained the following measurements of the patient: height, 4 feet 6½ inches; pelvis: interspinal diameter, nine inches; intercristal diameter, ten inches; and sacro-subpubic diameter, about one and a half inches. The transverse diameter of the pelvic inlet admitted two fingers. The child is alive and well. The ovaries were not removed. On Feb. 4th (four months after the operation) examination of the scar showed no sign of hernia.

CASE 4. *Cæsarean section for eclampsia at the sixth month of pregnancy.*—The patient, aged 23 years, was first seen on March 23rd, 1902. She complained of constant and severe headache. Her history was as follows. Menstruation ceased on Sept. 25th, 1901, and since then she had seen nothing. Since she became pregnant she had felt better than at any other period of her life. There had been no morning sickness. In the middle of February (five weeks previously) she slipped on the ice and fell heavily on her abdomen. Since then she had not felt right. About a week previously she felt tired and weary and had constant headache. Three days before her mother noticed that her face was slightly swollen. She had all along passed plenty of urine. The patient was pale and her eyelids were swollen and pitted slightly on pressure. She stated that she was about six and a half months pregnant and the size of the uterus corresponded with her belief. She complained of intense headache and constant sickness. There was very slight œdema of the feet. She had passed no urine since the previous night at 10 o'clock. The specific gravity of the urine was 1020, albumin being present to the extent of one half. The bowels had acted freely. On the 25th at 4 P.M. fits of an epileptiform nature commenced, which recurred about every half hour. At 5 P.M. two pints of normal saline solution were transfused into the median basilic vein: 15 grains of chloral and 30 grains of bromide of potassium were ordered to be administered every two hours, as well as a blanket bath. At 10 P.M. the patient was quite unconscious. No sooner had she recovered from one fit than she passed into another. No urine was obtained on passing a catheter. As soon as arrangements could be made and instruments prepared the following operation was performed. I must here acknowledge my indebtedness for most able assistance to Mr. M. Young and Dr. F. H. Morison. The patient being unconscious very little chloroform was required. After being lifted on to the table she was prepared as in the previous cases. An incision about six inches in length was made, extending from above the umbilicus to about one inch above the pubes. After opening the peritoneum the uterus was drawn out of the abdomen and packed round with sponges; it was then incised in the middle line, close to the fundus, for about four inches and the fœtus was extracted by its pelvis which first presented. The placenta, which was attached to the postero-lateral wall over the inner opening of the left Fallopian tube, was separated and removed and the uterus was squeezed between my two hands to cause it to contract. Four deep silk sutures, extending down to, but not including, the mucosa, were now inserted through the wall of the uterus and the uterine incision was more thoroughly closed by fine silk sutures through the peritoneal covering only. The abdominal incision was closed by silk-worm-gut sutures through the entire thickness of the parietes. Before tying the last stitch about two pints of saline solution at 110° F. were poured into the peritoneal cavity. The usual dressings were applied. The patient's pulse improved during the operation which occupied in all 40 minutes. The child had evidently been dead some time. The after-progress was as follows. On the 26th at 9 A.M. the temperature was 97·6°, the pulse was 90, and the respirations were 22. The patient had a quiet night though she was still unconscious. She had one pint of saline solution by rectal injection at 3 A.M. and 8 A.M. She had taken a little soda-water occasionally. There was no sickness. The catheter passed eight ounces of urine. The skin was dry and no sweating had taken place. At 4 P.M. the patient was still unconscious. She had had no fits. The catheter passed ten ounces of urine. She was ordered calomel (one grain) every two hours up to six grains. Injections of saline solution were administered per rectum as before every six hours. At 10 P.M. her temperature was 98°, the pulse was 88, and the respirations were 20. She was conscious enough to answer "Yes" and "No" to questions but recognised no one. The catheter passed two ounces of urine. On the 27th her temperature was 97·6° and her pulse was 84. She had had a good night. She asked me when I went in what I was doing there. She remembered nothing. 15 ounces of urine were passed by catheter. She was ordered soda-water and milk and weak tea. At 10 P.M. her temperature was 98° and her pulse was 88. The bowels were freely moved three times and urine was passed at the same time. She felt very comfortable and wanted to be up. Nourishment was freely taken. On the 28th her temperature was 98° and her pulse was 84. She had had a good night. She passed about 15 ounces of urine which contained about one-sixth albumin. At 9 P.M. her temperature was 99° and her pulse was 84. The bowels were moved once. She passed urine three times; about 12 ounces each time. She complained of headache and was ordered one grain of calomel, one grain of caffeine, and five grains of antifebrin. On the 29th the patient was very well. She passed urine in abundance. On the 30th she had a good night and the headache was gone. On the 31st the urine was quite free from albumin and of specific gravity 1020. On April 1st she had a slight fit during the night but did not bite her tongue. The wound was dressed, the stitches were removed, and the wound was found to be healed. On the 2nd she was ordered fish, toast, and a milk pudding. On the 4th she was looking much brighter and better. She could lie comfortably on either side. The appetite was good and she passed plenty of urine. Nothing further occurred to interrupt her recovery. On Sept. 29th she reported herself to me. She was three months pregnant and felt and appeared to be quite well. The operation scar was sound and healthy.

CASE 5. *Rupture of the pregnant uterus at the fourth month.*—A woman, aged 36 years, was seen with Dr. A. V. Macgregor of West Hartlepool on Sept. 23rd, 1901. She had had nine children, the youngest being one year old. She had one miscarriage between the third and fourth child. The history of the present illness was as follows. When three months pregnant the patient went on a railway journey and after reaching home had severe pains in the abdomen and slight discharge of blood from the vagina. These passed off without treatment. About a month later severe hæmorrhage set in and she sent for Dr. Macgregor on Sept. 14th. He was from home, but his locum-tenent went and plugged her vagina with iodoform gauze. As she did not improve a second medical man was asked to see the patient in consultation on the 17th. He introduced a tent and again plugged the vagina. On the 19th the same medical men dilated the cervix with Hegar's dilators, but nothing was taken from the uterus. On the 21st the patient felt one or two slight pains, followed shortly afterwards by a very severe prolonged pain, during which she felt "something give way." The pain ceased but the oozing, which had never ceased, continued. Previously to this Dr. Macgregor's locum-tenent had made out that the uterus was in the middle line and extended up to the level of the umbilicus. On the 22nd Dr. Macgregor saw her and asked me to consult with him at 6 A.M. The patient was blanched, had a weak and rapid pulse, and there was considerable oozing from the vagina. Her abdomen was distended and on palpation a hard mass of about the size of a cocoanut (? uterus) could be felt lying on the right side of the abdomen near the anterior superior iliac spine. In the pelvis rising above the brim and especially on the left side a boggy fluctuation could be elicited as of blood clot shut in a limited space. Per vaginam the cervix could with difficulty be felt high up and posteriorly; it moved freely and was surrounded by this same bogginess. No connexion could be made out between the cervix and the cocoanut-like mass. The oozing blood could be seen to issue

from the cervical canal. The vagina was firmly plugged with iodoform gauze. Two pints of salt solution were injected into the subpectoral region and the patient was sent in an ambulance wagon as soon as possible to the Hartlepools Hospital. The following operation was then performed. Chloroform was first administered and the anæsthesia was continued with ether. An incision was made in the middle line below the umbilicus with the patient in the Trendelenburg position. On opening the peritoneal cavity the left broad ligament was found to be greatly distended with blood which had stripped it off the pelvic wall and pushed the uterus over to the right. The intestines were protected by large sponges. An incision was then made into the left broad ligament and the hand inserted drew out at once blood clot, placenta, and a four months fœtus. Sponges were immediately packed into the cavity to check hæmorrhage. The incision in the broad ligament was then enlarged, the sponges were carefully removed, and bleeding points were clamped with forceps. It was now possible to make a thorough examination of the pelvis. The uterus was found to be torn across at the junction of the body with the cervix for more than half its breadth and the peritoneum had been stripped off the parietal and pelvic walls by hæmorrhage. The cavity thus created communicated through the patulous cervix with the vagina. Taking into consideration (1) the condition of the patient and (2) the ragged, probably septic, tear in the uterus we decided that a supravaginal hysterectomy would be the best treatment. The remaining half of the uterus was cut across and bleeding points were clamped and ligatured and the cavity of the pelvis was sponged out with 1 in 5000 corrosive sublimate lotion; the raw area was plugged with iodoform gauze, one end of which was passed into the vagina through the cervix, and the incision in the broad ligament was closed by a continuous catgut suture over the gauze. The ovaries and tubes were not removed. There was no blood in the peritoneal cavity and the abdominal incision was closed with silkworm-gut sutures. The usual antiseptic dressings were applied and the patient was put to bed in a somewhat collapsed condition. Ten minims of strychnine were administered hypodermically.

The progress of the case was as follows. The patient developed pneumonia, which we thought was caused by ether, and was exceedingly ill until Oct. 3rd. The gauze drain was removed from the vagina in 48 hours; the abdominal wound caused no trouble. So far as the operation was concerned all went well. Her chest condition, however, caused the greatest anxiety, and my belief is that to the untiring efforts of Dr. Strover, the house surgeon, and the nurses in charge the patient owes her life. Whenever her breathing became very embarrassed and restlessness became extreme inhalations of oxygen were resorted to by them and with the greatest benefit. Strychnine also was administered regularly every four hours. After Oct. 3rd her condition gradually improved and by the 12th she was almost well. Since the operation this patient has been strong and well.

Remarks.—Objections advanced against the Porro-Tait operation are: (1) the greater danger of sepsis; (2) the longer convalescence; (3) the risk of subsequent hernia of the scar; and (4) that the patient is rendered permanently sterile. My belief is that no other operation could be found so suitable for the cases and in the conditions that had to be dealt with in these patients. In Cases 1 and 3 the surroundings were so unfavourable that the ordinary requirements of decent life were not available, even hot water being obtained with difficulty. I may mention, as an illustration of our troubles, that in Case 1 all the light obtainable was derived from a small paraffin lamp which was so defective as to be useless except at close quarters. Mr. Young, in the absence of other assistance, was obliged to administer the anæsthetic with one hand and to hold the lamp over the abdomen with the other whilst the operation was in progress. In these cases, too, the patients had been long in labour and it is open to question whether, in such circumstances, the chances of sepsis are increased or diminished by removal of the exhausted and perhaps otherwise damaged uterus. The dangers of sepsis may be minimised by the short time occupied in the operation and the absence of all complicated intra-abdominal manipulations and the dangers from sepsis originating in the stump can be obviated by careful suture and antiseptic packing round it and dry antiseptic dressing of the stump itself. The objection that convalescence is somewhat prolonged carries no weight in such serious circumstances and the risk of hernia of the scar, though a real one, only deserves similar consideration. Also it may be said that if hernia of the scar should follow, an operation for its radical cure, performed before it has attained to large dimensions, is safe and successful.

Concerning the question of subsequent sterility I cannot regard the objection to it as other than false sentiment. To the woman herself the advantages of future sterility are obvious and this should be the first consideration; to future generations the benefits of additions derived from such stock are not so clear.

The advantages of the operation are that it can be done quickly, with few instruments, and with little assistance, and that loss of blood and consequently shock are reduced to a minimum. It was these considerations which decided me in its favour in Case 2, an enfeebled woman who could, at the best, only obtain short palliation of her extreme suffering by operation. Case 4 is one of unusual interest. Persistent headache was the only symptom pointing to albuminuria. Urine was abundantly excreted. There were no ocular changes and œdema was so slight as to escape ordinary observation. It has been my experience that pregnant patients with scanty urinary excretion and œdema of the subcutaneous tissues have not had fits. Dr. D. Drummond suggests that the œdema means low vascular tension and that high tension may be essential to the production of epileptiform convulsions. In this patient the early period of pregnancy at which the fits commenced is also noteworthy.

The treatment adopted may meet with criticism. So far as I can give my reasons for the operation they are as follows. Immediate delivery, so far as I could judge after a considerable experience of such cases, was imperative, for the patient without it was likely to die in the course of a few hours. The choice then lay between delivery by the undilated cervix and small vagina of a primipara and Cæsarean section. I acted upon my belief that the least dangerous method was by Cæsarean section and I feel convinced that the operation has a great future before it in other dangerous and complicated obstetrical cases.

Case 5, rupture of the uterus with expulsion of the fœtus and placenta into the broad ligament, is, so far as my information and a search through recorded cases guide me, unique. There can be little doubt that the uterus had been torn and stimulated to strong expulsive pains by the introduction of the dilator and the uterus, unable to empty itself through the undilated cervix, had ruptured extraperitoneally and expelled its contents into the potential space between the layers of the broad ligament, causing a similar hæmatocele to that found in an ectopic gestation ruptured into the same situation. The fact that prior to the introduction of the dilators the uterus was known to be in the middle line and of a size corresponding to the duration of the pregnancy helped us to exclude ectopic gestation in this case.

West Hartlepool.

THE CIRCULATION OF TISSUE FLUID IN MAN.

(PRELIMINARY COMMUNICATION.)[1]

BY GEORGE OLIVER, M.D., F.R.C.P. LOND.

IN the course of some observations made with the view of eliminating tissue fluid as a cause of variability in the samples of blood obtained for examination I found that the rolling of a tight rubber ring over the finger from the tip to beyond the interphalangeal joints will as a rule considerably raise the percentages of the blood corpuscles and of the hæmoglobin. I could not arrive at any other conclusion than that the ring not merely empties the vessels but likewise clears away any tissue fluid present in the skin and subcutaneous tissues.[2] The needle in puncturing the capillaries liberates a certain portion of lymph from the areolar tissue which surrounds them and this dilutes the blood. When,

[1] This communication is an extension of a preliminary note on the Measurement of Tissue Fluid in Man read before the Royal Society on June 11th, 1903.

[2] It may be that the lymph is dislodged from the skin only. Blood derived from punctures of varying depth has, however, afforded the same results.

however, both fluids have been dispersed as much as possible by the compression of the firm rubber ring, a puncture made just before removing the ring yields blood *per se*; for the blood instantly returns to the vessels, whereas an appreciable interval must elapse before the lymph reappears or is exuded afresh.[3] I am aware that some may regard it as an open question as to whether or not lymph can be dislodged from the skin and the tissues covering the phalangeal bones; consequently, I have exercised myself as to how all the facts observed can be otherwise accounted for. Having, however, failed to conceive of any other satisfactory explanation of them than this, and my friends, physiological and medical, being unable to suggest another view consistent with all the data observed, I cannot avoid the inference that the reading of the difference in the percentage of the corpuscles or of the hæmoglobin before and after the use of the ring provides a measure of the tissue lymph and makes the study of the circulation of it in man possible. We know that slight œdema can be completely transferred by compression from one part of the cellular tissue to another and that the tissue fluid present in the intercommunicating lacunæ of that tissue is akin to it.[4] The finger is anatomically well adapted to this mode of observation, for the phalangeal bones provide a firm and fairly uniform base on which the soft tissues may be effectually compressed.

This simple method having furnished somewhat unexpected results I naturally accepted them at first with reserve and for some time the data were allowed to accumulate, until at last it was quite apparent that they invariably fell into the same order. Inasmuch as the method did not provide results which were exceptional or erratic or contradictory and unaccountable, reliability on it became gradually established by the mere repetition of the observations. A number of observations have been made on normal subjects leading a quiescent life with comparative rest of the muscles and on persons subjected to varying degrees of exercise and to different temperatures. In this communication I limit myself, however, to a statement of results obtained in the former class of subjects only.[5]

The numerous observations which this inquiry necessitated on the corpuscles and on the hæmoglobin were made by the hæmocytometer tubes and the hæmoglobinometer which were described by me before the Physiological Society some few years ago,[6] and the specific gravity of the blood was determined by Roy's method. The blood pressures (arterial, capillary, and venous) were read by the hæmodynamometer.[7] Hill and Barnard's sphygmometer and Professor Gärtner's tonometer were also occasionally used in determining the arterial pressure.

The mode of observation.—A sample of blood is taken from the first easily flowing drop derived from near the root of the nail, the object being to obtain the actual proportion of lymph present in the tissues around the puncture. No difference, however, has been observed in the reading of the corpuscles when the first drop was wiped away and the pipette was filled from the second drop. Three stout rubber rings are rolled in succession slowly from the tip of the finger to beyond the interphalangeal joints, and these are then removed by placing over the finger a rigid tube on to which the rings are rolled; in this way compression of the tissues in one direction only is secured—namely, from the tip. The original puncture will generally suffice for supplying the second sample. The finger is held upwards until the blood is made to flow, for observation shows that compression does not now alter the proportion of the corpuscles. The hæmocytometer tubes are then read in the usual way[8] and the difference between the readings indicates the percentage of tissue lymph. The sample of blood obtained after the compression is invariably darker and more venous-looking than that yielded before the use of the rings. This difference is not due to a higher concentration of the blood, for it is apparent when the samples read alike, but is probably a result of the suspended oxidation of the tissues. The samples are then washed into the hæmocytometer tubes by which the corpuscles are enumerated in the manner elsewhere described.[9] Two graduated tubes and two measuring pipettes are required—one for the sample of blood taken before and the other for that obtained after the use of the rubber rings. The difference afforded by the readings of the tubes (before and after compression) will be referred to as "the lymph difference." Should the two samples of blood furnish the same readings there is no "lymph difference" and it is then inferred that no measurable lymph is present at the time of observation. This fact is referred to as "the zero point" of lymph.

[3] See Paragraph 8.

[4] The connexion between tissue lymph and œdema has not yet been worked out. It will, however, be shown that the exudation and absorption of tissue lymph are controlled by the capillary blood pressure, whereas it would seem that œdema is tissue lymph which has fallen away from that control and, being amenable only to the force of gravity, may therefore be regarded as the pathological analogue of hypostatic congestion as compared with the normal capillary circulation.

[5] Among other additions to this "Preliminary Note" now reprinted are one or two results of clinical observation on the tissue lymph circulation which illustrate the bearing of the physiological data on practical medicine.

[6] See Journal of Physiology, Cambridge and London, vol. xix.

[7] See Journal of Physiology, vols. xxii. and xxiii. The method employed for gauging the capillary pressure is not now described as I hope to improve it.

[8] See Blood and Blood Pressure, 1901.

[9] For a description of this method of enumeration the reader is referred to Blood and Blood Pressure, H. K. Lewis, 1901.

GENERAL CONCLUSIONS.

Some of the general conclusions afforded by the observations may be thus epitomised:—

1. *The amount of tissue lymph varies* at different times in the course of the day and each variation is of short duration.

2. *The ingestion of food produces a rapid flow of lymph into the tissue spaces*, which in an hour after meals acquires its maximum development and then slowly subsides and only ceases to be apparent after the lapse of from three to four hours (Fig. 3, A A A A).

3. *The digestive curve of variation always follows the same general type*, the rise being rapid, the acme short, and the subsidence somewhat gradual. The curve of variation is therefore rhythmical, recurring after each meal with perfect regularity (Fig. 3).

The following are two examples:—

Example I.

The time of observation.	Corpuscles. Per cent.	Corpuscles. Per cubic millimetre.	Difference.	Percentage of lymph.
Before the meal (breakfast)	99*	4,950,000	200,000	4
	103	5,150,000		
One hour after	91	4,550,000	750,000	15
	106	5,300,000		
Two hours after	94	4,700,000	550,000	11
	105	5,250,000		
Three hours after	96	4,800,000	400,000	8
	104	5,200,000		
Four hours after	98	4,900,000	150,000	3
	101	5,050,000		

Example II.

The time of observation.	Corpuscles. Per cent.	Corpuscles. Per cubic millimetre.	Difference.	Percentage of lymph.
Before the meal (dinner)	99*	4,950,000	None.	0
	99	4,950,000		
One hour after	91	4,550,000	850,000	17
	108	5,400,000		
Two hours after	94	4,700,000	600,000	12
	106	5,300,000		
Three hours after	104	5,200,000	None.	0
	104	5,200,000		

* The figure on the first line represents the percentage of corpuscles before, and the figure on the second line that after, compression of the finger by the rubber rings.

4. *As the digestive lymph wave develops there is a rise in the percentages of the corpuscles, of the hæmoglobin, and of the specific gravity of the blood*.—The differential readings of the hæmocytometer tubes, of the hæmoglobinometer, and of the specific gravity of the blood demonstrate the same fact—namely, that the blood becomes more and more concentrated

as the effusion of lymph into the tissues progresses and is most concentrated when the acme of the lymph wave is attained. The average rise of the corpuscles and of the hæmoglobin is 15 per cent. and that of the specific gravity is 7½° (Fig. 2).

5. *As the digestive wave declines there is a fall in the percentages of the corpuscles, of the hæmoglobin, and of the specific gravity of the blood.*—In proportion as the water effused into the tissues is restored to the blood the percentages of the corpuscles and of the hæmoglobin and the specific gravity of the blood fall.

6. *The interchange of fluid between the blood and the tissues may be measured.*—The observations have shown that 15 per cent. of the volume of the plasma flows into the areolar spaces during the maximum development of each lymph wave. Now if we assume that the blood forms one-thirteenth of the body weight, a man weighing 11 stones should exude 850 cubic centimetres (or 28 ounces) of lymph into the interstitial spaces of his tissues after each meal, during the short period occupied by the acme of the wave. This large interchange of fluid between the blood and the somatic tissues exceeds other fluid-transfers from the blood, consequently when the maximum exudation takes place the volume of the blood will shrink considerably; during absorption it will increase, and when absorption is completed it will acquire its fullest expansion. Therefore after each meal there are a rhythmical diminution and increase in the volume of the blood, in keeping with the periods of transfer of fluid to and from the tissues.

7. *The exudation of tissue lymph.*—Physiologists are divided as to whether tissue lymph is a pressure product (Ludwig, Starling, and others) or a secretion (Heidenhain). Inasmuch as the amount of lymph in normal subjects is always proportionate to the rise in the blood pressure (arterial and capillary), my observations seem to me to support Ludwig's theory. It therefore follows that the prolonged rhythmical curves of rise in blood pressure elsewhere described [10] following the meals are identical with the curves of the digestive lymph waves. In fact the agreement between the blood pressure and the exudation of lymph is so complete that the "lymph differences" provided by the hæmocytometer tubes and the readings of the mean arterial pressure by the hæmodynamometer furnish interchangeable scales, one point of lymph being equivalent to one millimetre of mercury pressure; so that from the blood pressure it is possible in normal subjects to predicate the amount of lymph and from the "lymph differences" may be inferred the degree of pressure which produces it. Moreover, in cases of splanchnic drain the limited exudation of lymph into the somatic tissues which is in keeping with a feeble rise in the systemic capillary pressure is markedly increased if that pressure be raised by mechanically dislodging the extra load of blood in the splanchnic veins.[11] Furthermore, a supernormal or a subnormal blood pressure determines a corresponding variation in the tissue lymph circulation.[12] The following example illustrates the agreement between the blood pressures and the amount of lymph:—

The time of observation.	Percentage of lymph.	Blood pressure in millimetres of mercury.	
		Mean arterial.	Capillary.
Before the meal ...	None.	100	20-22
Half an hour after	10	110	27-30
One hour after ...	16	116	30-35
One and a half hours after	8	108	27-30
Two hours after ...	5	105	25-27
Three hours after ...	None.	100	20-22

8. *The rate of the effusion of lymph.*—Fig. 1 gives some data which illustrate the rate of the exudation of lymph. The "lymph difference" was found to be 10. A series of observations were made at short intervals, allowing successively after each 15, 30, 60, 90, and 120 seconds to elapse before the blood was drawn after compression—the finger the while being held up to prevent gravitation of lymph. The aim of this observation was to ascertain how soon the "lymph difference" of 10 becomes reduced (showing how quickly a fresh exudation takes place) and the time required to replace the whole of that difference. The initial reading of 10 points was confirmed at (*a*) and (*b*), so that the tissue lymph was thus proved to be uniform in amount throughout the observations. The mean arterial pressure was also taken before each observation and was found to remain at the same reading. In 15 seconds some fresh lymph was formed already; in 30, 60, and 90 seconds the new exudation progressively increased and in 120 seconds the whole of the original amount was effused. That the exudation of lymph is rapid is also shown by the fact that in splanchnic stasis a low percentage of lymph—e.g., 6—may be considerably raised—e.g., to 15—in five minutes by applying a shot bag (14 pounds) to the abdomen.[13]

9. *The absorption or disposal of tissue lymph.*—In the normal condition of the circulation each exudation or lymph wave completely disappears before its successor is thrown out. Lymph can only be disposed of in two ways—namely, (1) by absorption into the capillaries and (2) by transmission along the lymphatics. Experimentation on animals has shown that muscular action of some kind is most important if not necessary to insure a flow of lymph along the lymphatics.[14] That fact, as well as others brought out in this inquiry, suggests that when the body is in a state of rest the fluid exuded into the tissues is mainly absorbed directly into the blood and I am disposed to think that further inquiry will confirm this view. An essential condition required to effect this absorption is a falling capillary pressure [15] and the absorption becomes as a rule complete when that pressure settles down to a little over 20 millimetres of mercury. Should the blood pressure when higher than this cease to fall absorption likewise ceases to go on and at whatever point it halts in its descent at that point the lymph flow from the tissues is arrested. Hence the continuous charge of lymph in the tissues of those in whom the blood pressure is supernormal.[16]

10. *The intermediary circulation.*—The to-and-fro transfers of fluid from the capillary to the tissue spaces constitute a circulation which appears to suffice for all the requirements of metabolism while the body is in a state of rest. This circulation, interposed as it is between the capillaries and the lymphatic vessels, may be appropriately termed the "intermediary circulation." It is merely an extravascular extension of the capillary circulation controlled by the forces which actuate that circulation.

11. *The physiological ends served by the lymph waves.*—Inasmuch as proteids are diffused through membranes in proportion to the pressure brought to bear upon them it may be inferred that the physiological end served by the rise in the capillary blood pressure which produces the digestive exudations of lymph is to supply pabulum to the tissues. Proteids are therefore probably distributed to them in the exudation current which flows from the blood (Fig. 2, a). Inasmuch as absorption does not commence until the blood pressure begins to fall, the current from the tissue spaces to the capillaries will not set in until after the acme of the wave has been reached. This return stream (Fig. 2, b) probably consists of a solution of salts and waste products only, and any surplus of proteids not used up in construction and repair of the tissues may be restored to the blood by transmission along the lymphatics rather than by direct re-transfer through the capillary wall, for there is a difficulty in explaining how proteids can be absorbed from the tissues by this direct route. If these views on the physiological purport of the lymph waves be correct it may be inferred:—1. That the intermediary circulation provides the mechanism, as it were, for the supply of pabulum to the tissues and for the removal of soluble waste products from them. 2. That the lymph wave which follows a meal insures the immediate supply of pabulum from the blood which restores all the tissues of the body at once and long before the food itself can be assimilated into the blood. Thus it is that the ingestion of food secures the speedy renewal of the energies, which is a matter of common experience; and therefore the exhausted tissues have not to remain unsupplied with fresh nourishment until the food taken becomes part of the common store of pabulum which the blood keeps ready

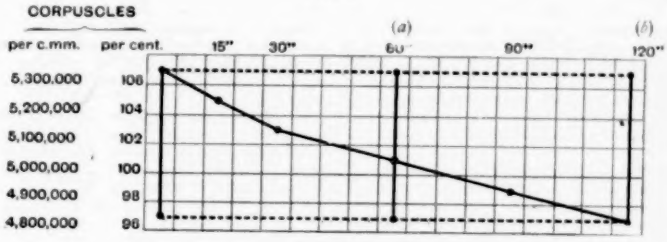
[10] THE LANCET, June 13th, 1903, p. 1643.
[11] See paragraph 16.
[12] See paragraph 13.
[13] See paragraph 16.
[14] Text-book of Physiology, E. A. Schäfer, vol. i., pp. 291 and 301.
[15] Starling regards the osmotic attraction of the proteids of the plasma as the force which determines the absorption of lymph from the interstitial spaces of the tissues, this force, which he estimates as equivalent to 30 millimetres of mercury, coming into play when the capillary blood pressure falls.
[16] See paragraph 13.

for distribution. 3. That beverages (tea, coffee, and alcohol) probably invigorate the body by inciting a flow of lymph into the tissues (Fig. 3). Beverages, however, viewed from this standpoint, differ from foodstuffs in that they fail to restore to the blood the outflow of pabulum which they create. They are therefore but temporary expedients of nutrition.

12. *The zero point of tissue lymph.*—It was a surprise to me to find that at certain times of the day in normal subjects the differential readings of the hæmocytometer tubes indicate the apparent withdrawal of tissue fluid; for though nothing hitherto has been ascertained as to variations in the volume of that fluid the presence of a certain portion of it at all times seemed to be more probable than the temporary absence of it. It is not improbable, however, that when the tubes afford a negative reading, some minimum quantity of tissue lymph is actually present, though too small to be measurable by that mode of observation. But whether this be so or not it is a well-assured fact (the observations, made with exceptional care, being now so numerous as to exclude doubt) that in normal subjects the tissue lymph is at certain times apparently absent, the two hæmocytometer tubes then reading exactly alike. This zero point is invariably met with after the lapse of three or four hours following a meal and as a rule just before the next meal, when, in fact, the lymph wave has ceased and is not found at any other time during the day.

In adults it is as a rule apparent when the mean arterial pressure is 100 millimetres of mercury and the capillary and venous pressures are 20 or 22 millimetres of mercury. From the few observations which have been made so far on growing subjects it would seem as if the blood pressure must

FIG. 1



Illustrating the rate of the exudation of tissue lymph.

FIG. 2.

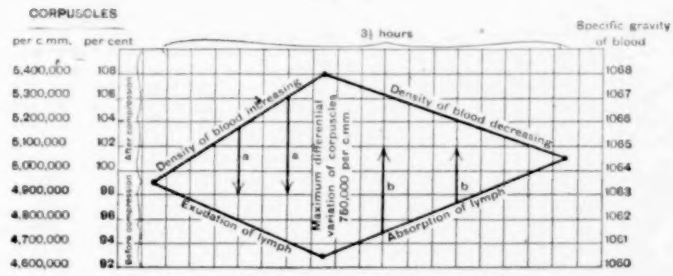
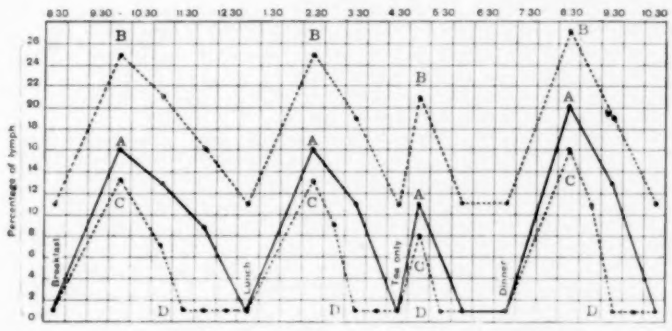


Diagram showing the average variation in the enumeration of the corpuscles and in the specific gravity of the blood before and after the compression of the finger during the flow and ebb of the lymph (digestive lymph wave); (a, a), exudation of lymph conveying proteids and salts to the tissues; (b, b), absorption of tissue fluid containing soluble waste and salts.

FIG. 3.



Typical digestive waves of tissue lymph. (A) Blood pressure normal; (B) blood pressure supernormal; (C) blood pressure subnormal; (D) zero points of lymph.

fall still lower in them before the zero point of tissue lymph is reached. Inasmuch as in young subjects tissue lymph is exuded under a lower capillary pressure than in adults it is probable that in them the capillary wall is more permeable. Exceptional cases have been met with in adults in which the arterial pressure follows a subnormal range—e.g., from 90 to 105 millimetres of mercury. But in such cases the capillary blood pressure was relatively higher and the lymph wave was found to be normal.

13. *Types of digestive lymph waves.*—The agreement between the readings of the tissue lymph and of the blood pressure is also well illustrated by the effect produced on the lymph waves by a blood pressure above or below the normal. In Fig. 3 are represented a day's series of three typical forms of digestive lymph waves. The continuous line (A) shows the curves which are observed in subjects in whom the blood pressure follows a normal course, and the interrupted lines (B and C) indicate variations of the normal waves produced by a rise in the blood pressure (B) and by a fall of that pressure (C).

The typical physiological wave is that which rises out of an apparently lymph-free condition of the tissues and completely subsides to the same zero point. When such is the case in the majority of adults the arterial blood pressure rises from 100 millimetres of mercury before to 115 or 120 millimetres of mercury after a meal and then falls to 100 millimetres of mercury before the following meal; and the capillary blood pressure rises from 20 to 35 millimetres of mercury and again subsides to 20 millimetres of mercury.[17] But when the blood pressure follows a higher course than normal there is invariably a large percentage of lymph in the tissues before every meal; then the lymph wave rises out of and subsides into a certain quantum of lymph permanently present (Fig. 3, B B B). This form of the wave was observed in high altitudes where the hæmodynamometer indicated a rise in the blood pressure[18]; this rise was therefore demonstrated by two totally different modes of observations—namely, directly from the arteries and indirectly from the differential readings of the blood.

When the arterial blood pressure is subnormal the lymph waves become somewhat reduced in amplitude and duration, and the lymph-free intervals before the meals are consequently lengthened (Fig. 3, C D). This type of lymph wave was observed in the medium altitudes (from 1000 to 4000 feet) which lower the blood pressure.[19]

14. *The density of the blood in circulation is largely controlled by the capillary blood pressure.*—According to my observation the specific gravity of normal blood is in close agreement with the number of the blood corpuscles per cubic millimetre of blood, one degree in specific gravity being nearly equivalent to 100,000 corpuscles, or to 2 per cent. on the scale of the hæmocytometer tube. I will therefore refer to the density of the blood as expressive of the percentage of the corpuscles as well as of the specific gravity. This inquiry has shown that the density of the blood in circulation cannot be accurately ascertained from a sample yielded by the finger in the ordinary way; it can only be learnt after the tissues have been compressed, as by the rubber rings. This procedure has demonstrated that the density of the blood increases *pari passu* with the rise in the capillary blood pressure and in the consequent exudation of lymph, and decreases with the fall in that pressure and the gradual withdrawal of lymph from the tissues. Furthermore, it has likewise shown that when the blood pressure becomes supernormal, as in high altitudes, in chronic goutiness, and in kindred ailments, the density of the blood rises in proportion to the increased and persistent exudation of tissue lymph; and when the pressure falls below the normal range the fluid exchange between the blood and the tissues diminishes and the density of the blood tends to be low, and, indeed, is generally low.

15. *The bearing of lymph observation on the clinical determination of blood pressure.*—It has been conclusively shown by my clinical work that the hæmocytometer tubes afford useful information, not only in regard to the intermediary circulation in various ailments, but in definitely settling the question of blood pressure—whether it be normal, supernormal, or subnormal. I have found this mode of observing the blood pressure through the blood a most reliable one. As a clinical method it possesses one great advantage over the ordinary modes of directly determining the blood pressure. The data it furnishes are not affected by a temporary nervous perturbation of the patient.

As previously stated, the scales of the hæmocytometer tubes and of the hæmodynamometer are interchangeable within the normal range of variation (from 100 to 115 millimetres of mercury), but for arterial pressures above 115 or 120 millimetres the percentage of lymph rises in a decreasing ratio; for example, there may be no more than 25 per cent. or so, though the arterial pressure may be 135 or 140 millimetres. Within the normal range of variation of the blood pressure there appears to be a fairly constant relation between the rise and fall of the arterial and capillary blood pressure, but beyond that range the rise of the capillary pressure may be modified by arteriolar contraction, or if it is not so modified the filtering capacity of the capillary wall may be relatively lessened for the higher capillary pressures.[20]

16. *Clinical observation of the intermediary circulation.*—The types of digestive waves just described (Fig. 3, B and C) are frequently met with in the clinical field. The waves which rise out of, and which subside into, a varying quantity of lymph are met with when the blood pressure (arterial and capillary) is supernormal, as in chronic goutiness, &c. In this class of case the prominent features of the peripheral circulation are (1) a low venous pressure and (2) a raised capillary pressure. A persistent increase of resistance in the venules would account for these alterations in the circulation in chronic gout; and this increased resistance may arise either from contraction of the muscular fibres of the venous radicles[21] or from obstruction to the flow of blood through them in consequence of an increase in tissue tension (tissue lymph pressure).[22]

The volume of the lymph before a meal (a time when no lymph should be apparent) may be as large as it is at the acme of a normal lymph wave or it may be even larger. The following typical example selected out of many others illustrates this fact and also shows the effect of treatment in restoring the zero point of lymph:—

—	First observation.	Second observation (6 days).	Third observation (12 days).	Fourth observation (18 days).
Arterial pressure (millimetres of mercury)	145	112	104	100
Capillary pressure (millimetres of mercury)	35	30-35	25	20-22
Venous pressure (millimetres of mercury)	15	30	25	20
Percentage of lymph	27*	12	4	0

* The percentage of lymph was in this case exceptionally high, but in chronic goutiness readings of from 15 to 22 per cent. at the normal lymph-free periods of the day are not uncommon.

All the observations in this case were of course made at a time of the day when in a normal state of the circulation the reading of lymph is *nil*.

In all the cases of undoubted gout so far submitted to observation this obstructed form of the intermediary circulation has been found but whether it will be invariably present in gout cannot at present be affirmed. It is conceivable that cases of gout may be met with in which tissue residua may lodge in the tissue vacuoles in consequence of an imperfect

[17] THE LANCET, June 13th, 1903, p. 1643.
[18] THE LANCET, June 13th, 1903, p. 1646.
[19] THE LANCET, June 13th, 1903, p. 1646.

[20] It has been shown by experiments on filtration through anima membranes that "the quantity of filtrate rises with the pressure, but in lower ratio" (Schäfer's "Text-book of Physiology," vol. i., p. 281). Increasing viscosity of the blood, produced by increasing capillary blood pressure, may likewise retard filtration. Experiments have also demonstrated that a period of rest between two filtration experiments increases the permeability of the membrane (op. cit.). This fact may suggest that the rhythmical falls of the capillary blood pressure observed during the ebb of the lymph waves and when digestion is at an end will restore the capillary wall as a filtering membrane; and that the alternating rise and fall of the capillary blood pressure is the best possible arrangement for effecting filtration and for the recovery of the filter. Observation has shown that a comparatively limited rise of the blood pressure, if persistent (e.g., five or ten millimetres of mercury), is of clinical importance in profoundly modifying the fluid exchange between the blood and the tissues.

[21] THE LANCET, June 13th, 1903, p. 1644.

[22] Starling has found that "a rise of tissue tension above the pressure of the veins causes collapse of these veins, a rise of capillary pressure, and a diminished flow of blood through the part." (Schäfer's Text-Book of Physiology, vol. i., p. 307.)

interchange of fluid between them and the capillaries—the capillary blood pressure being too low for the development of the normal lymph waves. All the remedial measures which counteract chronic goutiness liberate the embarrassed peripheral circulation by reducing the increased venular resistance and thus they secure a rise in the venous pressure, a fall in the capillary pressure, and a reduction in the exudation of tissue lymph. When the obstructed intermediary circulation in gouty subjects is thus relieved and the normal flow and ebb of tissue lymph are restored the general health is improved and the local manifestations of the gouty state as a rule either disappear or are lessened. In acute gout the condition of the blood, of the circulation, and of the tissue lymph circulation, has appeared to me to differ from that in chronic goutiness. For some years I have recognised that when gout becomes acute the blood pressure falls and the density of the blood diminishes, and this change in the blood pressure and in the blood takes place rapidly. Since employing the method of measuring the tissue fluid, which enables one to ascertain with accuracy the density of blood in circulation, I have obtained some confirmation of this position—though my opportunities for observing this transition have so far been few. It would seem as if, when gout becomes acute, the embarrassment of the peripheral circulation which characterises the chronic form of the disease suddenly vanishes and the fall of the capillary blood pressure which ensues suffices to secure complete absorption of the pent-up tissue fluid, and then once more the normal flow and ebb of the lymph tides are established. If this be so it follows that whatever quickly lowers the capillary blood pressure may precipitate an attack of gout and that in consequence of the restoration of the normal fluid exchange between the blood and the tissues the patient becomes less gouty—at any rate, for a time.

A reduction in the systemic capillary pressure and a corresponding lessening in the volume and duration of the lymph waves are well illustrated, as a rule, in those cases in which there is drainage of blood into the splanchnic veins from loss of tone in the splanchnic arterioles. It has been observed when this failure of lymph exudation is apparent that the application of pressure to the abdomen, either by means of a shot bag or by tightening an abdominal belt, will not only raise the arterial and capillary pressure, but will in five minutes create an ample flow of lymph. The following is an example of the temporary restoration of the normal lymph wave by applying a shot bag (14 pounds) to the abdomen.

Percentage of Tissue Lymph and Mean Arterial and Capillary Blood Pressure One Hour after a Meal.

—	Before application of the shot bag.	Five minutes after application of the shot bag.
Percentage of lymph	6	15
Mean arterial pressure, millimetres of mercury	106	115
Capillary pressure, millimetres of mercury	25	35

When in this case the splanchnic inadequacy was corrected the digestive exudation of lymph into the systemic area was restored.

One Hour after a Meal.

Percentage of lymph	15
Mean arterial pressure, millimetres of mercury	115
Capillary pressure, millimetres of mercury	35

Then the application of the shot bag no longer altered the blood pressure and improved systemic nutrition was indicated by a rise in weight and a gain in strength and well-being.

17. *The bearing of the foregoing data on our views upon gout and kindred ailments.*—This inquiry has afforded me some confirmation of the correctness of the generally entertained opinion that goutiness primarily depends on the retention of some waste product or products—whether the *materies morbi* be specified as uric acid or whether it be regarded as a group of residua. There may be differences of opinion as to how gout originates but as to how it is maintained when established my observations leave no doubt in my mind. They have shown that it is essentially dependent on a derangement of the intermediary circulation and that therefore the tissues themselves form the arena in which gouty disturbances develop and manifest themselves. Residua may accumulate and be deposited in the interstitial spaces of the tissues, because their removal is thwarted, either by an excessive capillary blood pressure limiting the absorption of fluid from these spaces or by a diminution of that pressure reducing the fluid exchange between the blood and the tissues. Hence the two leading types of gout which are well recognised. According to my observation the continuous presence of a large quantity of tissue lymph provides an important condition for the development of the local manifestations of gout, which were present in by far the majority of the cases observed, and those few cases in which local signs of gout had not so far declared themselves might fairly be said to be gouty—in the sense of potential gout.

This inquiry is still in progress and the results it has already yielded afford some assurance that further experience of the method of observation on which it is founded will extend still more our knowledge of the intermediary circulation. Nearly 2000 observations in various cases have not only confirmed the conclusions formed during the experimental stage of the inquiry, but have considerably enlarged these conclusions.

Harrogate.

INFANT FEEDING.[1]

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IN submitting a paper on infant feeding to this society I wish to state very clearly at the outset that I make no claim to any special knowledge of the subject which would entitle me to speak with anything resembling the voice of authority. On the contrary, I am well aware that amongst my hearers there are many whose experience in infant feeding has been far greater than my own and who would have produced a much more valuable paper than I can give you. My only title to speak on the subject is the fact that for nearly a year I have been to some extent responsible for the supply of an infant food in somewhat novel circumstances and an account of that experiment, together with such results as I can give at the present time, may be of interest to the society and may start a discussion from which I, at all events, may hope to profit.

The subject of infant feeding is undoubtedly one of the most important questions which concern us as medical men, but it is far from being a subject of purely academic or professional interest. The well-being of a man and consequently his efficiency as a social unit depend to a great extent on the physical conditions that surround him in that most plastic period, the first year of life, and of these conditions perhaps the most important is food. The kind of food that goes into the stomachs of our babies and its effect on them are questions of national importance, especially to the people of this country at the opening of the twentieth century. In the last few years the British have become conscious of their imperial destiny. We rejoice over the fact that we have possessed ourselves of many of the most desirable portions of the globe and we look forward to an extension of this process and to a time when our race will dominate the earth. Unfortunately, there are some important facts which appear to be strangely out of harmony with this ideal. It is not necessary to reflect long upon the qualities essential for any race of men successfully adopting an imperial career to arrive at the conclusion that the most essential of all is a plentiful output of babies, and we have to face the fact that the most striking feature of the vital statistics of this country in recent times is the decline in the birth-rate during the last 25 years. The number of births per 1000 population in England and Wales was 36·3 in 1876. Since that year there has been a steady decline and last year the birth-rate was 28·6—that is to say, in 26 years our output of babies has decreased 21·2 per cent.

I do not propose to discuss the causes of this striking sociological phenomenon. It is possibly to some extent due

[1] A paper read before the South-West London Medical Society on May 15th, 1903.

to a real loss of fertility, but no doubt the preponderating cause is the conscious artificial limitation of families, and it is interesting to note that the decline in the birth-rate began a year or two after the prosecution of two well-known Malthusian lecturers gave an enormous publicity to the whole question. At all events, it will hardly be suggested that the forces which have brought about the fall in the birth-rate will operate less actively in the future than in the past, and it is difficult to avoid the conclusion that in the production of men and women we are approaching the standard of our Australian colonies, where the birth-rate is almost as low as that of France.

Our supply of babies, then, is diminishing and that we are not taking sufficient care of those we have is evident from the fact that our infantile mortality is as high now as it was 50 years ago. The number of deaths under one year of age per 1000 births registered was 156 in the five years 1896-1900, which is as high a figure as that in any quinquennium since 1850. This high infantile mortality is the more remarkable as during the last 25 years the general death-rate has considerably declined owing in a large measure to improvements in sanitation which must have affected infant life. It would appear that some counteracting force specially inimical to infant life had come into operation, and this is doubtless to be found in the increase in the practice of artificial feeding which every medical practitioner of long experience will admit has taken place during recent years. The substitution of artificial infant foods of whatever nature they may be for the natural food which is the result of ages of selection and adaptation is a phenomenon of first-rate biological importance, the full effect of which upon the race we may be only beginning to appreciate. That the breast-fed infant has a far better chance of survival in the struggle for existence than his hand-fed brother is a fact which clinical experience and statistics alike fully bear out and which receives some explanation from Ehrlich's theory of immunity. To quote from Professor Welch's Huxley Lecture: "The infant comes into the world with its immunising bodies, the anti-bodies, smaller in amount and less energetic than those possessed by the healthy adult. It is an important function of the mother to transfer to the suckling through her milk the immunising bodies, and the infant's stomach has the capacity, which is afterwards lost, of absorbing these substances in an active state. The relative richness of the suckling's blood in protective anti-bodies explains the greater freedom of the former from infectious disease."

But it is unnecessary to dwell on the advantages of breast feeding. We all agree that mother's milk is immeasurably the best infant food; but it is a food which year by year becomes more difficult to obtain, and the public look to us to provide a substitute. Setting aside such expensive luxuries as wet-nurses, ass's milk, and mare's milk there are three kinds of substitutes for mother's milk available: (1) cow's milk, more or less modified and artificialised; (2) condensed milks; and (3) proprietary foods. In seeking for a substitute for mother's milk we must bear in mind, as Dr. Chapin points out, that "anything aside from breast milk that is put into an infant's stomach is a foreign substance that may cause digestive disturbance," and our aim should be to obtain a food resembling as closely as possible mother's milk. Tried by this standard proprietary foods are at once put out of court. Mother's milk is a purely animal product; proprietary foods are largely vegetable in composition, as nearly all contain wheat flour or other matter of vegetable origin and many contain unaltered starch, a substance which the young infant is quite unable to digest. Generally speaking, these foods are deficient in fat, too rich in carbohydrates, and contain no anti-scorbutic element. Proprietary foods are not now in favour with the profession, but with the public their popularity is great. They have the advantage that they are easy to prepare and to the overworked housewife this is a consideration of the first importance.

Condensed milks, like proprietary foods, are popular with the public and for much the same reasons. Over 500,000 hundredweights of condensed milk are imported into this country every year. Apart from the separated condensed milks, which are of course destitute of fat, it may be said generally that most of the brands of condensed milk upon the market are deficient in fat and contain an excessive amount of cane sugar and are quite unsuitable as substitutes for mother's milk. The best brands of unsweetened milks are more useful but they have the disadvantage that the milk soon goes bad after the tin has been opened. Moreover, all the condensed milks are destitute of anti-scorbutic elements and we can all recall cases of rickets occurring amongst children fed on these milks. Nevertheless, the best brands of condensed milk must be regarded as valuable food for temporary use in cases where cow's milk cannot be given.

We now come to the consideration of cow's milk, which we shall all agree is much the best substitute for human milk generally available. But although cow's milk resembles mother's milk much more closely than do the condensed milks and the proprietary foods which we have just considered, there are important points of difference which require careful consideration. These may be classed under two heads: (1) differences inherent in the milks, and (2) accidental differences. The inherent differences are of two kinds—(*a*) mechanical and (*b*) chemical. In considering the former we must bear in mind that cow's milk comes into the world for a definite purpose—namely, to nourish the calf; and the calf is an animal which differs from the human infant as much in the constitution of its digestive tract as it does in outward appearance. The calf's four stomachs form 70 per cent. of its digestive tract, while the single stomach of the human infant forms only 20 per cent. In giving cow's milk to babies we are, as Dr. Chapin points out, giving a hard curdling milk intended for a polygastric digestive tract to an animal with a monogastric digestive tract, intended for the reception of a soft curdling milk. We have therefore first to deal with the massive curd. The chemical differences are also important. Cow's milk contains too much proteid, too little sugar, and is deficient in lecithin—a substance which is now known to be an important constituent of human milk. Lecithin forms a large part of the nervous system, and as the nervous system in an infant for a long time after birth is in a very undeveloped condition this deficiency in lecithin of cow's milk may be a more important matter than is generally supposed. Lastly, there is the most important difference of all, that whereas human milk passes directly from the secreting gland to the mouth of the baby and is practically free from micro-organisms, cow's milk in making the journey between these two points passes through a variety of processes which result in its contamination with millions of more or less objectionable bacteria. This is an accidental point of distinction, not one inherent in the milks, but it is an important difference and one not easily remedied in a wholly satisfactory manner.

There is a movement now on foot to introduce into this country the methods of clean milk production which have been successfully established in some parts of America. These methods consist merely of the observance of strict cleanliness in milking and in storage, and in the rapid cooling of the milk when drawn from the cow. This movement deserves the strongest support. The methods of milk production and storage usually carried out in this country are most discreditable to a country which has hitherto been the pioneer in public health matters. No public health measure is more urgently needed than a reform in the milk-supply; but even if we could bring clean wholesome milk to every household it would not solve the problem of the prevention of bacterial contamination. Of all the milk borne diseases summer diarrhœa is by far the most deadly and in this disease, as Dr. Newsholme has pointed out, the greater part of the contamination takes place in the home of the consumer. If this were not so how could we explain the fact that children fed on sterilised proprietary foods suffer from diarrhœa and that even breast-fed babies are not infrequently attacked? In the poorer districts, at all events, it is not enough to bring pure milk to the door of the consumer; it must be supplied in such a form as to prevent its contamination within the home.

From the facts we have considered, then, we arrive at the following conclusions: (1) mother's milk is infinitely the best infant food and every effort should be made to encourage breast feeding; and (2) cow's milk is the best substitute for mother's milk, but it should be carefully modified to suit the infant's digestive capacity, free from chemical preservatives, and as far as possible from bacteria, and in the poorer districts it should be supplied in such a form as to reduce the possibility of its contamination in the home to a minimum. Some two years ago the health committee of the Battersea Borough Council seriously considered the question of the high infantile mortality in the poorer parts of the borough, due more or less directly to errors in feeding. The committee were aware that in many districts the sanitary authorities had attacked this problem

by entering upon an educational campaign—by issuing advisory leaflets and by employing women health visitors to enter the houses of the poor to give practical instructions to the mothers in the home modification and storage of cow's milk. While heartily sympathising with this action, from which, indeed, much good may be expected, it was felt that instruction alone hardly went to the root of the matter. In the better-class families, no doubt, home modification of cow's milk is often successfully carried out; but to the overworked housewives in the crowded homes of the poor, with their multifarious duties to perform, it is a matter of serious difficulty, as all who have had practical experience in the rearing of infants must admit. The council, therefore, decided to undertake the modification and sterilisation of cow's milk on a large scale and to supply the milk at a low price in stoppered bottles, each bottle containing sufficient milk for one meal and no more. This method of attacking the problem of infantile mortality was originated by Dr. Léon Dufour in Fécamp in 1894 and was introduced into this country by the St. Helens corporation in 1899 on the advice of Dr. F. Drew Harris, the medical officer of health. Many of you have visited the council's depôt, but for the benefit of those who have not I will give a brief account of the method on which it is worked. The milk arrives at the depôt in the early morning. It is supplied by a local dairyman and is guaranteed to contain not less than 3·25 per cent. of fat and to be free from chemical preservative, and the farms from which it comes are at all times open to the inspection of the officers of the council. Upon arrival the milk is modified by the addition of water, cream, and a lactose, and a little salt is also added. The modifications are as follows: preparation A contains one part milk and two parts water, preparation B contains two parts milk and two parts water, and preparation C contains two parts milk and one part water. The amounts of the humanised milk given vary with the age of the child. The number of bottles per child are given in Table I.

TABLE I.

—	Age.	No. of bottles per day.	Amount per bottle in ounces.	Amount per day in ounces.
1	Below 2 weeks.	9	1½	13½
2	Between 2 weeks and 2 months.	9	2½	22½
3	Between 2 and 3 months.	8	3	24
	The above receive preparation A.			
4	Between 3 and 4 months.	7	4	28
5	Between 4 and 5 months.	7	4½	31½
6	Between 5 and 6 months.	7	5	35
	The above receive preparation B.			
7	Between 6 and 8 months.	6	6	36
8	Between 8 and 12 months.	6	7	42
	The above receive preparation C.			

After modification the milk is bottled and is then, the stoppers being closed, placed in the sterilising chamber. Steam is injected and the temperature of the milk is raised to 212° F., where it remains for from five to ten minutes. It is then allowed to cool and the bottled milk is supplied to the consumer in wire baskets, each basket containing 24 hours' supply. The next day the basket of empty bottles is returned and a fresh supply of milk is obtained. When a child is entered at the depôt the mother is instructed in the proper method of using the milk and a printed leaflet of instructions is also given to her. The method is very simple: when the time for feeding arrives the bottle is placed, unopened, in a basin of water until it reaches body temperature. It is then opened and a small rubber teat, supplied at the depôt, is put on the mouth of the bottle and the child is fed directly from the sterilised bottle. The use of a feeding-bottle is obviated, which alone is a great gain, and the danger of contamination in the home is reduced to a minimum. The homes of the milk-users are visited by the lady sanitary inspector who sees that the instructions are properly carried out. The depôt was opened on June 12th, 1902, and at the present time nearly 400 babies are being fed from it. I have lately made an inquiry as to the kind of food given to the children before coming to the depôt. Of the 306 infants visited 110 had been breast-fed, 105 had been fed on condensed milk and proprietary foods, and 91 on cow's milk more or less modified.

You may now ask whether any evidence can be produced as to the beneficial effect of the milk on infant life. In my opinion the most valuable evidence is the testimony of the medical practitioners who have had the largest experience of the milk. Some months ago I addressed a letter to the local medical men asking for an expression of opinion as to the value of the milk. The replies received were in nearly all cases most satisfactory, and those practitioners who had had the largest experience of the milk spoke of it in the highest terms. I attach much importance to this evidence. Turning to the statistical evidence, it should be said at once that it is doubtful whether the full value of the work of the depôt can be expressed in figures. To compare the infantile mortality in the borough last year with that in the previous years is fallacious. The summer of 1902 was cold and wet, summer diarrhœa was not prevalent, and the mortality was low all over the country. It is suggestive, however, to compare the infantile mortality in the borough during the last six months of the year with that in the three neighbouring boroughs which most resemble Battersea in social conditions, &c., and in the county of London. Table II. shows that in all these districts the mortality was greatly diminished in 1902 but that the diminution was more marked in Battersea.

TABLE II.

Period.	Deaths under 1 year to 1000 births.				
	Fulham.	Lambeth.	Camberwell.	County of London.	Battersea.
Six months ended Dec. 31st, 1897 ...	197	169	202	196	197
" " 1898 ...	205	185	200	198	198
" " 1899 ...	249	203	204	213	201
" " 1900 ...	177	163	184	186	195
" " 1901 ...	182	168	163	177	202
Average 1897-1901	202	177	190	194	198
Six months ended December, 1902 ...	168	140	161	152	143
Percentage reduction	16·8	20·9	15·2	21·6	27·7

This table shows that the reduction in infantile mortality was distinctly greater in Battersea than in the other districts and without attaching too much importance to these figures I see no reason to doubt that the depôt has contributed to this result.

Additional evidence of the value of the depôt is afforded by comparing the mortality amongst the children fed from it with the infantile mortality in the borough. During the six months ending Dec. 31st, 1902, 558 children were fed on the milk for varying periods; 32 of these lived outside the borough, and in 60 additional cases, owing to wrong addresses being given and to removals, no information could be obtained as to the subsequent history of the child. Deducting these cases there remain 466 children of whom definite information was obtained. The ages and the deaths at each age period are given in Table III.

The death-rate amongst the children fed upon the milk was therefore 98·7 per 1000. This rate cannot, however, be compared with the infantile mortality in the borough—i.e., the number of deaths under one year per 1000 births—as 72 of the depôt-fed children were above one year old. On deducting these children there remain 394 infants under one year, of whom 39 died. This is equivalent to a rate of 98·9 per 1000, which compares favourably with the infantile mortality in the borough, which was in the six months, July to December, 1902, 143 per 1000 births. This comparison, however, does scant justice to the depôt. The borough includes the South-Western subdistrict, where the infantile mortality is low, whereas the depôt children were nearly all drawn from East and North-west Battersea, where it is high.

TABLE III.

Age on admission.	Number of children.	Number of deaths.
Below one week	13	—
1-2 weeks	12	1
2-3 ,, ...	10	1
3-4 ,, ...	11	—
Total below one month ...	46	2
1-2 months	55	6
2-3 ,, ...	37	7
3-4 ,, ...	46	3
4-5 ,, ...	46	1
5-6 ,, ...	29	4
6-7 ,, ...	42	5
7-8 ,, ...	32	5
8-9 ,, ...	17	2
9-10 ,, ...	22	1
10-11 ,, ...	15	2
11-12 ,, ...	7	1
Total below one year	394	39
12-18 months	42	1
18-24 ,, ...	16	2
2-3 years	11	3
3-4 ,, ...	1	—
4-5 ,, ...	1	1
5-6 ,, ...	1	—
Total	466	46

In Table IV. no account is taken of the children from South-west Battersea.

TABLE IV.

Number of infants attending the depôt from East and North-west Battersea, July–December, 1902.	Deaths.	Death-rate per 1000.	Number of deaths under one year in East and North-west Battersea, July–December, 1902.	Mortality per 1000 births.
363	36	99·1	315	163·5

But even this comparison is not fair to the depôt. A large number of the children attending were already seriously ill on admission and some died before the milk had had a fair trial. Of the 39 infants under one year fed from the depôt who died no fewer than 14 had taken the milk for less than one week. A fairer comparison is to deduct these deaths and to deduct also from the deaths in the borough and in the subdistricts the deaths occurring in the first seven days of life. When this is done the results given in Table V. are obtained.

TABLE V.

Death-rate per 1000 of depôt-fed infants, excluding deaths of infants taking the milk for less than one week.		Infantile mortality per 1000 births, excluding deaths of infants under seven days old.	
Death-rate of infants attending from the whole borough.	Death-rate of infants attending from East and North-west Battersea.	Mortality in the whole borough.	Mortality in East and North-west Battersea.
63·4	69·8	118·9	139·7

From these figures it appears that the mortality of infants in the borough during the last six months of 1902 was 87·5 per cent. higher than the mortality in the depôt-fed children, and that taking the mortality in East and North-west Battersea only the difference is no less than 103 per cent.

It may be argued that the above comparison is fallacious on the ground that the mothers of the children attending the depôt may be assumed to be more intelligent and alive to the children's welfare than the average mother, and that in any case these children would have had a better chance of survival. There is an element of truth in the contention, but that this influence is more than counteracted is apparent, in my opinion, from the following considerations: 1. By far the greater number of children attending the depôt were in a state of ill health on admission and a large number were already seriously ill. The milk is in many cases regarded more as a medicine than as a food, and when the baby has recovered from the illness which brought him to the depôt the milk is often discontinued and the usual condensed milk diet is resumed. The depôt death-rate should therefore be regarded as somewhat analogous to a dispensary death-rate. Moreover, the milk is frequently misused, being poured from the sterilised bottle into the ordinary lethal bottle with the long rubber tube. 2. Most of the depôt infants were under six months old, whereas the majority of the infants outside would be aged between six and 12 months. This is an important point, as the mortality is always much greater in the first period than in the latter; in fact, no less than 50 per cent. of the infant deaths occur in the first three months. If the ages of the depôt infants and those outside were the same the figures would be still more favourable to the former. 3. The depôt children are all artificially fed, whereas a considerable number of those outside are fed from the breast. It is not claimed that the council's milk is anything but a poor substitute for human milk. No artificial food can be, or probably ever will be, anything else. The depôt children should be compared with children outside *who are fed artificially*. But figures for this comparison are not available. 4. An unusual proportion of the depôt children are illegitimate and the mortality amongst such children is always higher than in legitimate children. Battersea contains more houses registered under the Infant Life Protection Act than any other borough in London and a large number of these "nurse children" are fed on the council's milk. From these considerations I cannot regard the depôt-fed children as constituting a favourably selected class, and I see no reason to doubt that these statistics afford substantial evidence of the value of the depôt.

It is sometimes objected that this method of infant feeding gives rise to scurvy and rickets. This has not been our experience in Battersea. I have examined a considerable number of children who have been fed on the milk for long periods without finding evidence of either disease. I have made inquiries of the medical men who have largely prescribed the milk and can find no evidence of scurvy or rickets due to feeding on the milk. From our experience it would appear that the danger of producing scurvy and rickets by feeding infants on boiled and modified cow's milk has been greatly exaggerated.

Battersea.

THE IMMUNISATION OF ANIMALS TO THE BACILLUS TYPHOSUS.

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THE production of an anti-typhoid serum for therapeutic use is of obvious importance in view of the wide distribution of the disease. The difficulties, however, both practically and theoretically are many and great. Among the theoretical difficulties are the general nature of typhoid fever. The process by which the bacillus typhosus produces its pathogenic effects on the organism invaded is not simple or well defined. It is not like the case of tetanus where a soluble toxin acts upon certain tissues. In tetanus the disease can be reproduced by the injection of the soluble products of the tetanus bacilli and these products are found to attack definite cells. In typhoid fever the organism is attacked as a whole, though the brunt of the attack falls on the tissues first invaded—i.e., the lymph follicles of the intestine. Again, the reactions of the organism invaded by the bacillus typhosus are not well defined. There is a

general disturbance of the normal metabolism. The chief changes are to be found in the blood, the lymphoid tissues, the bone marrow, and the nervous system. These, however, differ in no marked feature from the similar reaction evoked by the entrance of many other pathogenic micro-organisms.

A practical difficulty in the production of active immunity to the typhoid bacillus is the separation or production of a soluble toxin. As mentioned above, certain bacteria secrete soluble toxins; but in the case of the typhoid bacillus, though a bouillon culture of the bacillus may possess toxic properties, yet the effects of such a filtered or killed culture when injected do not amount to the reproduction of the disease—in fact, one of the primary difficulties is to follow the process by which the bacilli produce their effects in the tissues of the organism invaded. The bacilli must act either by the setting free of an intracellular toxin on their death or destruction by the cells—that is, the bacilli are destroyed before their toxins can act on the tissues—or the bacilli interact closely with the cells of the tissues attacked by a process in which harmful substances are secreted *in situ* in response to the stimulation of the bacilli by the cells of the surrounding tissues. In view of the proved bactericidal power of blood and the tissues the former contention is at least very probable. In support of it there is the work of Pfeiffer on cholera and of Buchner and Koch both of whom claim to have demonstrated the presence of intracellular toxins. Recently Rowland and MacFadyen have brought forward experiments to show the presence of intracellular toxins in the bacillus typhosus. Their method was to grind up agar cultures of the bacillus and so to obtain a soluble toxin. The latter hypothesis, in the case of typhoid fever, has been supported by Welch. He supposes that the invading bacilli develop special cytotoxins injurious to the host and that this can only take place when both bacilli and cells are living. In typhoid fever, Welch points out, the most characteristic lesions are the proliferation of the lymphoid tissues of the intestine, the mesenteric glands, and the spleen pulp. Mallory even believes that this proliferation is caused by the specific action of the typhoid toxin. Welch agrees with this idea and thinks that the proliferation of these cells is partly compensatory and partly defensive. As a working theory we have taken the first view, that the chief toxic effect is due to the toxins set free by the destruction of the bacilli.

The experiments recorded below were undertaken to show: (1) the virulence of the particular bacillus used; (2) the effect of normal horse plasma on bouillon cultures; (3) the immunisation of a horse to the bacillus typhosus; (4) the value of the serum from such a horse; and (5) the bactericidal power of normal blood compared with that from an immunised horse on the bacillus typhosus.

EXPERIMENTAL RESULTS.

I.—*Experiments as regards the Virulence of the Organism.*—A rabbit was injected intravenously with one agar culture. Death occurred in six hours. Cultures of the bacillus typhosus were recovered from the heart, the spleen, and the peritoneal exudation. Next Guinea-pig A was injected with one cubic centimetre of a 24 hours broth culture and died on the first day. Guinea-pig E was injected with two cubic centimetres of a 24 hours broth culture and died in six hours. Cultures were recovered from the heart and the spleen in both cases. Then a comparison of the virulence of the organism recovered from the rabbit with that from the guinea-pigs was made. Guinea-pig A was injected with one cubic centimetre of broth culture intraperitoneally (*from the rabbit*); death occurred in 12 hours. Guinea-pig B was injected with one cubic centimetre of a broth culture (from a guinea-pig), with no result.

II.—*Experiments with the Serum from Horse 11d.*—(This horse was immunised to *other strains of the bacillus typhosus.*)

Guinea-pig.	24 hours broth culture.	Serum.	Death.
A	1 c.c.	—	First day.
B	1 c.c.	1·0 c.c.	,,
C	2 c.c.	1·0 c.c.	,,
D	3 c.c.	0·5 c.c.	,,
F	3 c.c.	0·5 c.c.	,,
G	3 c.c.	1·0 c.c.	,,

Control experiments were made on Nov. 24th on this serum with two other strains of the bacillus typhosus used in the process of immunising, &c., as follows: Guinea-pig A was injected with half a culture of the B. T. Weale; death occurred on the first day; a culture was obtained from the heart's blood. Guinea-pig B was injected with half a culture of the B. T. Weale plus one cubic centimetre of serum, with a negative result. Guinea-pig C was injected with half a culture of the B. T. Linnell; death occurred on the first day; a culture was obtained from the heart's blood. Guinea-pig D was injected with half a culture of the B.T. Linnell plus one cubic centimetre of serum, with a negative result.

III.—*Experiments with the same Serum, with the addition of Normal Horse Plasma and Normal Rabbit's Blood (for complement).*

Guinea-pig.	24 hours broth culture.	Serum.	Result.
F	2 c.c. ...	2 c.c.+1 c.c. N.H.P. ...	Died first day.
G	3 c.c. ...	3 c.c. ...	,, second day.
H	3 c.c. ...	3 c.c.+1 c.c. N.H.P. ...	,, ,,
A	1 c.c ...	1 c.c. ...	,, ,,
B	2 c.c. ...	2 c.c. ...	,, sixteenth day.
C	2 c.c. ..	1 c.c.+1 c.c. N R.B. ...	,, tenth day.
D	3 c.c. ...	2 c.c. ...	,, second day.
F	3 c.c. ...	1 c.c.+2 c.c. N.R.B. ...	,, ,,

IV.—*Experiments with Subcutaneous Injections of same Mixtures of Serum and Cultures of the Bacillus Typhosus.*

Guinea-pig.	Bacillus typhosus.	Antityphoid serum.	Result.
L	1 agar culture ...	— ...	—
K	,, ...	0·5 c.c. ...	Died on first day.
H	,, ...	0·5 c.c. ...	,, ,,
N	,, ...	1·0 c.c. ...	,, ,,
O	,, ...	2·0 c.c. ...	,, ,,
M	,, ...	3·0 c.c. ...	,, ,,

V.—*Experiments with Filtered Cultures.*

Guinea-pig.	Filtered killed culture.		Result.
A	.....	2 c.c.	*Nil.*
C	.....	4 c.c.	*Nil.*
	Filtered living culture.		
H	.....	2 c.c.	Large swelling.
K	.....	4 c.c.	Died on fourth day.

VI.—*Experiments with a Culture digested by Normal Hor Plasma and Filtered.*

Guinea-pig.	Filtrate.	Result.
F	2 c.c.	Large swelling.
D	4 c.c.	Died on third day.

VII.—*Experiments with Serum from Horse 54.*—This horse was immunised to cultures digested by normal horse plasma (filtered).

Guinea-pig.	Typhoid culture.	Serum.	Result.
HH ...	1 c.c. ...	— ...	Died on second day.
GG ...	1 c.c. ...	1 c.c. ...	*Nil.*
KK ...	1 c.c. ...	2 c.c. ...	Died in one hour (probably accidental).
A ...	1 c.c. ...	— ...	Died in 18 hours.
B ...	1 c.c. ...	1 c.c. ...	*Nil.*

The peritoneal exudation of Guinea-pig A was full of the bacillus typhosus.

A	...	1 c.c. ...	— ...	All died on first day.
B	...	1 c.c. ...	1·0 c.c. ...	
C	...	1 c.c. ...	0·5 c.c. ...	

But post-mortem examination of the peritoneal exudation of Guinea-pig A showed that it was cloudy, while that of Guinea-pigs B and C was clear. Microscopical examination showed that the exudation in Guinea-pig A consisted of cells with large numbers of typhoid bacilli. Few cells could be seen in the exudation from Guinea-pigs B and C. Cultures from the peritoneal exudation of Guinea-pig A showed the presence of large numbers of the bacillus typhosus, but in Guinea-pigs B and C the exudation proved to be sterile, pointing to the complete destruction of the bacilli. The other features of this experiment will be referred to later.

VIII.—*Agglutination Experiments with Serum from Horse 54, after the Intravenous Injection of Living Cultures of the Bacillus Typhosus.*—Serum, 1 in 5000, gave a positive reaction to the B. T. Westcott; serum, 1 in 5000, gave a negative reaction to the bacillus coli communis; serum, 1 in 10,000, and 1 in 10,000 normal serum mixed gave a positive reaction to the B. T. W.; and normal serum, 1 in 10,000, gave a negative reaction to the B. T. W.

IX.—*Experiments with Filtered Typhoid Toxin.*—Agglutination reactions.

B. T. W. toxin + 1 in 500 serum (Horse 54) + Kieselguhr.					No clumps.	
,,	,,	+ 1 in 50	,,	,,	,,	,,
,,	,,	+ 1 in 500	,,	,,	+ bacillus coli.	,,
,,	,,	+ 1 in 50	,,	,,	,,	,,

X.—*Experiments on the Bactericidal Power of the Serum of Horse 54 after the Injection of Living Cultures of the Bacillus Typhosus.*

(*a*) Serum from Horse 54, plus broth cultures of B. T. W., was incubated for 24 hours. Good growths of typhoid bacilli were obtained but they were not homogeneous. The bacilli were in fairly compact flocculi and the broth was nearly clear.

(*b*).

Normal serum.	B.T.W.	No. of colonies.
5 drops	One loopful.	8
15 ,, ...	,, ...	
30 ,, ...	,, ...	1500
Serum of Horse 54.		
5 drops	,, ...	Uncountable
15 ,, ...	,, ...	,,
30 ,, ...	,, ...	

N.B.—The serum itself was *sterile*.

(c) *Normal Blood.*—An equal quantity of *normal* blood was run into a 12 hours culture of B. T. Westcott. This mixture was incubated for four hours and then one, two, three, and five drops of the mixture were added to melted agar at 42° C. just before pouring the plates.

Plate 1	.....	1 drop.	No colonies.
,, 2	.....	2 drops.	,,
,, 3	.....	3 ,, ...	1 colony.
,, 4	.....	5 ,, ...	4 colonies.

(d) *Blood from Horse 54.*—The horse was bled directly into a 12 hours culture of the bacillus, an equal quantity of blood and culture being taken. The whole was incubated for four hours. Plates were then inoculated with one, two, three, and five drops of the mixture. The serum from this horse was proved to be sterile by cultivation experiments.

Plate 1	.....	1 drop	288 colonies.
,, 2	.....	2 drops	480 ,,
,, 3	.....	3 ,, ...	670 ,,
,, 4	.....	5 ,, ...	1450 ,,

These results are concordant and when compared with those of X (*c* above the difference in bactericidal power is very striking.

XI. After a suitable period of rest Horse 54 was again immunised by the injection of the products of the digestion of the typhoid bacillus. The animal was bled and the serum was drawn off. The serum was then injected together with a lethal dose of bacilli in some of the following experiments:—

(*a*).

Guinea-pig A ... 1 loopful B.T.W. ...		Control	... Died on first day.
,, M ... 1	,, ,, ...	,,	... Died in 12 hours.
,, B ... ½	,, ,, ...	,,	... Ill for five days.
,, L ... 1	,, ,, ...	1 c.c. serum	... Alive and well.
,, K ... 1	,, ,, ...	½ c.c. ,, ...	,,
,, G ... 1	,, ,, ...	¼ c.c. ,, ...	,,

(*b*).

Guinea-pig A ... 1 loopful B.T.W.	...	... Died in *5½ hours.*
,, B ... 1 ,, ,,	+ 1 c.c. of serum	... Alive and well.

The B.T.W. was recovered from the spleen of Guinea-pig A.

(*c*) An emulsion of a 24 hours growth on agar was made with normal saline solution (sterile). This was injected intraperitoneally.

Guinea-pig A ...	1 c.c. of emulsion	Died on first day.
,, B ...	2 c.c. ,, ...	,,
,, M ...	2 c.c. + 1 c.c. of serum	Alive and well.

XII. A three days growth in broth of the B. T. Westcott was digested with normal plasma and filtered.

Guinea-pig T ...	4 c.c. of filtrate ...	Ill with swelling at the site of injection.
,, U ...	{ 4 c.c. of filtrate } + { 1 c.c. of serum } ...	Alive and well, no swelling.

COMMENTS ON EXPERIMENTAL RESULTS.

I. The virulence of the organism, especially when introduced into the blood stream, was certainly very considerable. In this connexion it must be noted that even in a short time (six hours) there was a peritoneal exudation containing numbers of the bacilli. The cultures recovered from this rabbit were even more virulent than those obtained from guinea-pigs infected intraperitoneally.

II. This series of experiments shows the "special" nature of different strains of the bacillus typhosus. The serum from a horse immunised to other strains failed to protect against the B. T. Westcott. This was in spite of the fact that it possessed protective powers towards the strains used in its production.

III. The unsatisfactory results of the experiments in Series II. might be explained by an absence of some factor concerned in the protective action of fresh serum. According to Ehrlich's hypothesis this wanting factor might be the "complement," so normal horse plasma from freshly drawn whipped blood was injected with the protective serum. This failed to protect the guinea-pig against the typhoid bacilli, but on adding normal rabbit's blood to the horse serum there was a slight amount of protection in one case—in that of Guinea-pig C. This was possibly due to the bactericidal power of the freshly drawn blood of the rabbit.

IV. These experiments showed that the subcutaneous injection of guinea pigs with the B. T. Westcott, even when accompanied by protective serum from Horse 11, proved fatal in every case. So the subcutaneous injection was no more favourable for this animal than was the peritoneal.

V. A virulent culture, of which one cubic centimetre killed under 24 hours, was killed by heating to 65° C. for two separate periods of half an hour. It was filtered and injected subcutaneously but failed to produce any effect on the guinea pig. A similar culture was filtered without sterilisation. The filtrate proved sterile as far as culture experiments showed. Four cubic centimetres of the filtrate, however, proved fatal to a guinea-pig in four days. This is the only case in which such a filtrate has caused anything more than a large local swelling, but it points out the great difference between a heated and an unheated filtrate.

VI. The next experiments were undertaken to see how far the digestion of typhoid cultures with fresh blood would set free intracellular toxins. It was found that a three weeks culture of the B. T. Westcott, digested for 24 hours in an incubator at 37° C. and then filtered, yielded a sterile filtrate. Also microscopical examination showed that very few bacilli were present after the digestion. This filtrate produced large local reactions in the injected animals and in one case a death on the third day after injection. The filtrate therefore was toxic and so it was employed in the immunisation of Horse 54.

VII. Experiments were then carried out with the serum from Horse 54 after a course of immunisation. The first series of Guinea pigs, HH, GG, and KK, was rather disappointing, but Guinea-pig HH was dead on the second day and Guinea-pig GG was protected. One death may have been accidental (Guinea-pig KK). But an examination of the peritoneal exudation in each guinea-pig was most instructive. The peritoneal exudation of Guinea-pig HH was full of typhoid bacilli, whilst Guinea-pig KK contained very few comparatively. In the second series the control guinea-pig died in 18 hours, while the serum-protected guinea-pig did not show any lesion. The peritoneal exudation of Guinea-pig A was full of bacilli. The third series, however, was rather more disappointing. All the guinea-pigs died. But there was a remarkable difference in the peritoneal exudate in each case. The exudate of Guinea-pig A contained large numbers of typhoid bacilli, while those of Guinea pigs B and C proved sterile and no bacilli could be found microscopically. Here, obviously, the protective action of the serum was sufficient to kill the bacilli, but not to protect the guinea-pigs against their toxic action. Bacteriolysis was apparently complete, though there was but little evidence of any antitoxin in the serum. These experiments go a good way to prove that toxins are set free by the death and destruction of the typhoid bacilli and that it is the absorption of these toxins that causes the disease. The serum was able to kill and to destroy the bacilli, as shown by their absence from the peritoneal exudation. The death of the guinea-pigs was not due to the rapid invasion of the blood by the bacillus typhosus. It was probably due to the toxic products of the digestion of the bacilli. These results are all in support of the general view taken of the action of the bacillus typhosus on the invaded organism (see Introduction).

VIII. Agglutination experiments showed that the injection of the typhoid toxin, prepared as above, resulted in the production of definite agglutinins.

IX. Control experiments were made with Kieselguhr and the bacillus coli communis.

X. Following these experiments, Horse 54 was injected *intravenously* with cultures (*living*) of the B. T. Westcott. The animal took the injections well, but towards the end of the experiment appeared to be ill and off its feed. The horse was bled soon afterwards. Experiments with the serum would seem to show that the injection of these living cultures resulted in an abolition of even the normal bactericidal power of the blood. Compared even with normal blood its bactericidal power was much less—that is, the horse had reached the "negative" phase of its reaction to typhoid infection. The serum itself was sterile, but it had lost its bactericidal properties. In this connexion it is worth noting that in all experiments on the bacillus typhosus care must be taken to incubate the culture after adding the serum and before plating out to count the colonies. The reason is obvious. If this is not done "one colony" on the plate is really the representative of a clump of, may be, a dozen or more bacilli. This difficulty is met by allowing the surviving bacilli to grow for four hours in a fluid medium before pouring plates of the mixed serum and culture. The results are in any case more intelligible.

XI. (*a*) These experiments show that a very definite degree of active immunity can be aroused in an animal injected with the digested typhoid bacilli. The serum from such an animal can protect guinea-pigs, at all events, against the B. T. Westcott. The virulence of this organism is shown by two out of the three control animals dying and in each case the bacillus was recovered in pure culture. (*b*) As confirming the above results these two experiments are important. An agar culture of the bacillus recovered from Guinea-pig A above was used. One loopful suspended in normal saline solution was injected into the peritoneum of

one guinea-pig and one loopful together with one cubic centimetre of serum into the peritoneum of the other guinea-pig. The former died in five and a half hours and the latter is alive and well. This acute death was due to the peritoneal infection without any doubt. There was an extensive peritoneal exudation but no other sign of injury to the viscera or the blood-vessels. The exudation was full of the bacilli but contained very few cells. Cultures from the exudation were positive and an abundant growth was obtained on cultures inoculated from the spleen of Guinea-pig A. (*c*) These results with accurately measured amounts of an emulsion of typhoid bacilli amply confirm those of (*a*) and (*b*) above.

XII. The injection of the typhoid "toxin" was followed by a transitory illness, severe and acute while it lasted, and a local reaction at the site of injection. The serum from Horse 54 when injected along with the toxin protected the animal from the local and general effects.

CONCLUSIONS.

1. The best method of obtaining a typhoid toxin is by the digestion of the bacilli.
2. This product is toxic.
3. This product can excite a reaction in susceptible animals during which they develop immunity to the injection of living typhoid bacilli and the serum from such an animal can protect another animal against typhoid infection.
4. The injection, intravenously, of living typhoid bacilli may result in the production of a "negative phase" of resistance. (See X. on previous page.)

Herne Hill, S.E.

A CASE OF PYOPERICARDIUM FOLLOWING PUERPERAL SEPSIS; PARACENTESIS; EXCISION OF RIB AND DRAINAGE.

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A MARRIED woman, aged 38 years, was admitted to the Sheffield Royal Hospital on June 6th, 1903, suffering from pain and dyspnœa. For the following notes I am indebted to Dr. F. W. Schofield, house physician, and to my clinical clerk, Mr. F. J. Blackmore. The history of the illness was as follows. The patient was confined on May 9th. Four days later she got up and had a rigor. On the next day she had severe abdominal pain and distension. She was feverish but had no chest symptoms. About a week later she developed pneumonia, both bases being affected. The abdominal symptoms disappeared. The fever and weakness had continued and her breathing had got much worse. Her personal history was that she had inflammation of the lungs ten years ago but no other illnesses. There was nothing of importance in the family history. Her condition on admission was as follows. She looked very ill. There was marked orthopnœa and she lay half turned towards the left side. Her breathing was very shallow and laboured, 60 per minute, and there was slight frequent cough. The expression was extremely anxious and restless. The pulse was 132, small, weak, and regular. The tongue was dry but not furred and there were some old ulcers. The face was emaciated and anæmic, with bright hectic flush patches on the cheeks. There was much sweating of the face and head. The skin generally was moist. With regard to the chest, owing to the extreme dyspnœa and distress of the patient, the physical examination, especially of the back of the chest, was somewhat difficult and of necessity hurried. It was evident that the bulk of the breathing was being performed by the right side, the left hardly moving at all. No cardiac impulse could be felt. The area of cardiac dulness was greatly increased, extending from the upper border of the second left rib above, half an inch to the right of the sternum as low as the right fifth rib, and reaching on the left to the mid-axillary line, the upper margin passing above the left nipple and the lower along the left fifth space. The heart sounds were almost inaudible over the whole area. A slight pleuritic friction sound was heard at the fifth left space in the nipple line. There was some dulness at the right base behind and moist sounds were heard at both bases behind. There was a small patch of bronchial breathing at the angle of the left scapula behind, but percussion and auscultation of the left base were very difficult. There was also some bronchial breathing above the cardiac dulness in the second left interspace in front. The abdomen was somewhat full and distended but no fluid was detected. The bowels were opened freely and the urine was scanty but normal in quality. The patient slept badly and was very restless. There was no cyanosis. The temperature was irregular, usually rising at night up to 100° or 101° F. and falling in the morning to 99° or less. A large pericardial effusion was diagnosed and seeing the history of the case and the septic symptoms following pregnancy, a purulent character was suspected. It was therefore determined to explore the pericardium and to proceed according to the nature of the contents found. Accordingly, on June 9th I asked my surgical colleague, Dr. G. Wilkinson, to see the case with me with a view to operative procedure. It was decided to explore the pericardium at first and to ascertain the nature of the fluid and if purulent to proceed to evacuation and drainage. A needle was therefore inserted into the left fifth interspace between the cartilages. It passed directly into solid matter and moved up and down with respiration, no fluid being obtained. This having failed we determined to try again in the fifth space further to the left, where the dulness was well marked. The needle was again inserted in the same space close to the left of the nipple line, but just as in the previous attempt the point entered solid substance, moved with respiration, and no fluid was obtained. It was evident that the fifth space was too low and that it was impossible in that space to get above the diaphragm, which the needle had entered each time. As the patient was considerably distressed and very restless a little chloroform was given and the needle was inserted into the fourth left space between the cartilages, and this time the needle was free and pus flowed into the syringe.

The patient being slightly under chloroform Dr. Wilkinson made an incision two inches long over the fourth left costal cartilage. A piece of rib and cartilage about one inch long was excised after carefully isolating it from the periosteum and underlying tissues, the inner end of the excised portion being about one inch from the sternum. The pleura was not exposed. On opening the pericardium greyish yellow thin pus gushed out with considerable force, its flow varying with the heart beat. Altogether 20 ounces of pus came away. Air was freely sucked in with each respiration. The pericardium was afterwards united by two stitches to the skin around and a soft collapsible tube of large bore was inserted into the pericardium. A profuse discharge of pus continued through this up to the death of the patient. After the operation the heart was plainly visible through the wound. The respirations became at once deeper and fuller, the pulse improved, and the patient was more comfortable. During the next few days the discharge from the pericardium was considerable, the temperature fell to nearly normal but the pulse and respiration rates kept much as before. The patient's appetite improved for a few days, but in spite of it she gradually failed and died a week after the operation on June 16th. She became almost maniacal for two days before death, trying to get out of bed and destroying the clothes, &c.

At the post-mortem examination in addition to the purulent pericarditis there was found a small purulent pleuritic effusion at the right base which explained the dull area noticed in that position during life. There were also great dilatation of the stomach and general suppurative peritonitis, with matting together of the abdominal contents and various local collections of pus; these were chiefly situated in the neighbourhood of the uterus and ovaries which were adherent to the intestines. A bacteriological examination of the pus from the pericardium showed various streptococci and staphylococci.

Cases of purulent pericarditis in which evacuation of the contents of the sac by operation have been performed are not of frequent occurrence. Unfortunately, when they do occur there is often, as in this case, a general condition of such a grave character that though the operation may be successful as far as it goes the concomitant pathological conditions are incompatible with life. But however hopeless the prognosis may be as to recovery there is no doubt that temporary relief from a very distressing cardiac obstruction is obtained by timely operative measures and the fatal termination may be postponed or rendered less painful. If, however, the purulent pericarditis is merely local and not part of a general septic process, all the more urgently is free

evacuation demanded and in such cases, though grave, ultimate recovery may be hoped for, as, for instance, in the first successful case recorded in this country by Dr. S. West in 1882[1] in which recovery was complete and permanent.

In looking over the present case and its symptoms and signs there are several points which seem worthy of notice. As stated in the notes of the case, it was difficult to make a very complete examination of the patient before the pericardium was evacuated, partly because of her great dyspnœa and distress and partly because of her mental condition, which later developing into mania was all through restless and she resisted any attempt at an examination. This made detailed percussion or auscultation by no means easy. In spite of this, however, the diagnosis of a large pericardial effusion was quite easy and must, I think, usually be so, provided there is no large accompanying pleural effusion. Particularly, I would lay stress on the appearance of the chest and of the respiratory movements, with the general decubitus of the patient, the full but motionless præcordial area, without any cardiac pulsation, the increased compensatory respiratory movement performed by the right side increasing the contrast between the two chest fronts, and lastly, the orthopnœic attitude of the patient, half turning to the left so that the left side was supported by the pillows. It was the position as of one having a heavy weight in the lower left thorax, which was actually the case. No pericardial friction sound was audible in this case. (A slight friction sound was heard at the fifth space in the nipple line but it was pleuritic.) The absence of this, which is usually a pathognomonic sign of pericarditis, has been many times recorded in pyopericardium; in fact, some authorities would deny its presence in any case. Possibly the very nature of the pericardial surfaces coated with thick soft purulent material prevents the formation of the sounds. I have certainly seen more than one tuberculous pericarditis in infants in which, although daily auscultation of the chest had been made up to the time of death, no signs have been observed of the extensive pericarditis which has been found post mortem.

The quantity of pus removed at the time of the operation—viz., 20 ounces—is large for a pyopericardium, though nothing like the amount which has been removed in cases of serous effusions or blood effusions. The force with which it was expelled was very considerable, showing the great pressure which must have been exerted on the cardiac walls. In these circumstances it is surprising how little obstruction it seemed to produce upon the venous circulation, for although the dyspnœa was great there was little noticeable distension of the great veins or cyanosis. There was no œdema of the chest wall over the pericardium. The pulse was very small before the pus was removed and improved in volume with its gradual withdrawal, whilst the heart, which was evidently lying above the level of the incision prior to the operation, came down to the wound and from that time forwards could be plainly seen beating (moving from right to left at each systole) each time the wound was dressed. The left portion of the front of the right ventricle was found post mortem to be the part visible. The pulsus paradoxus so often found in these cases was not observed at any time. The probable explanation of the fifth space being too low for the insertion of the exploring needle is that there were extreme dilatation of the stomach and general tympanites in connexion with the peritonitis, as observed at the necropsy. This had pushed up the diaphragm above its normal position and no doubt added considerably to the marked dyspnœa which returned even after the pericardial sac was emptied. As will be seen from the notes of the case the dulness found at the base of the right lung was due to a small purulent effusion in the right pleura; possibly it was owing to this that the small area of dulness, known as the "sign of Ewart," at the left base was not detected. The other posterior basal sign—namely, the patch of bronchial breathing just below the angle of the left scapula, known as the "sign of Pin"—was very well marked. As regards these accessory signs, however, they are no doubt valuable as confirmatory in cases of doubt, but their importance is as nothing to the gross evidence of an effusion which is obtained from an examination of the front of the chest. In conclusion, my thanks are due to my colleague, Dr. Wilkinson, for his valuable surgical assistance in the case and for his report on its surgical aspect.

Sheffield.

[1] Transactions of the Royal Medical and Chirurgical Society, vol. lxvi.

FIVE ILLUSTRATIVE CASES OF CONGENITAL HEART DISEASE.

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WE are induced to describe the following cases of congenital cardiac defects as they form a somewhat remarkable series of the more common lesions and detailed descriptions of such anomalies in cardiac development are somewhat scanty in our own literature.

The pathogeny of congenital heart disease is so intimately bound up with the development of the organ that we are impelled at the outset to describe in as brief a fashion as possible the main features of this undeniably complicated process. The details of the development of the heart are fully described in Macalister's "Text-book of Human Anatomy," Minot's "Human Embryology," and Foster and Balfour's "Elements of Embryology," &c. The best *résumé* of the pathology of congenital heart disease which we have met with, and to which we are greatly indebted, is Moussous's "Maladies Congénitales du Cœur," Paris, 1895. We have not discovered its equivalent in the English language.

THE DEVELOPMENT OF THE HEART.

The primitive heart, which, it will be remembered, is formed by the coalescence of the two symmetrical ventral tubes of the hæmocœlom, soon becomes divided into several parts. Posteriorly the allantoic, hypoblastic, and lateral somato-pleural veins coalesce in the sinus venosus which opens by a single aperture into the auricle. A short and narrow segment, the auricular canal, separates the auricle from the ventricle, which is of considerable length and at its anterior end communicates through the fretum Halleri, the most constricted part of the vascular system, with the bulbus arteriosus. So far the heart is single, but at an early period septa develop within the different cavities and ultimately divide it into two halves, right and left. The septum of the ventricle is the first to make its appearance, and is closely followed by that of the bulb, but the latter is the first to be completed, usually in the seventh week and a few days before the completion of the former. The septum of the auricle is the last to commence and the last to be finished, and it is only in the fifth month that it attains its full development; but it must be remembered that the foramen ovale remains patent throughout intra-uterine life and only closes some weeks or months after birth.

The division of the auricular canal.—The division of the auricular canal commences with the appearance of two small tubercles on the anterior and posterior surfaces. These grow towards each other and ultimately fuse, thus dividing the passage into two parts.

The formation of the auricular septum.—The auricular septum makes its first appearance on the superior surface of the auricular cavity and is situated a little to the left of the median line. The anterior portion in particular grows rapidly downwards and soon extends to, and joins, the anterior tubercle of the auricular canal, which has not yet fused with its posterior complement. A similar development obtains posteriorly but authorities differ as to whether growth takes place downwards from the original fold, or upwards from the posterior tubercle of the auricular canal. The central part of the septum does not develop so rapidly as the anterior and posterior segments, so that at one stage the septum is sickle-shaped, a large aperture in the lower part still affording communication between the two auricles. This space, however, is soon filled up, and the tubercles of the auricular canal coalesce with the septum and with each other, so that for the time being the two auricles are completely separated. This complete separation is, however, not long maintained. The central portion of the septum is

thin and soon becomes perforated by a number of minute holes, one of which enlarges and persists while the others are filled up.

A second septum then makes its appearance in close proximity to the first but in the median line, growing downwards from the auricular roof. Like the first this is incomplete but the aperture in it does not coincide exactly with that in the primary septum, being situated nearer the posterior wall. The two septa become fused together but from the want of correspondence in the sites of the apertures an oblique passage is left, the foramen ovale. Viewed from the right side, the margins of this aperture are thick and muscular and are derived from the secondary septum. Looked at from the left side the posterior wall of the aperture is thin and fibrous, representing the remnant of the primary septum. It covers over the aperture on the right side. During intra-uterine life blood passes from the right into the left auricle along this passage but with the development of the pulmonary circulation after birth the pressure in the left auricle rises, becomes greater than that in the right, and so closely opposes the left wall of the channel against the right wall. Adhesions ultimately form and permanently close the communication. In a considerable number of adult hearts the closure is incomplete and a more or less narrow passage can be found on examination. In most cases, however, the aperture is very small and functionless, as the fibrous valve is well developed, and from the higher tension in the left auricle must have completely closed the channel. There is no developmental defect, but simply a want of organic adhesion between the sides of the duct (non-closure).

Formation of the bulbar septum.—The septum of the bulb makes its first appearance between the fourth and fifth branchial arches, as two small tubercles on the anterior and posterior walls of the vessel. These increase in size and coalesce, dividing the artery into two parts, the left, however, being slightly in front of the right. The septum develops rapidly from above downwards and in its growth alters its plane, so that at its junction with the heart it is placed transversely and the left vessel is situated in front of the right.

Formation of the ventricular septum.—The septum of the ventricles commences as a small sagittal ridge at the apex of the ventricular loop, and grows upwards. The development of its extremities is, however, more rapid than that of its centre, so that it becomes crescent-shaped, with the concavity upwards. The anterior part ultimately reaches, and fuses with, the left side of the bulbus, while the posterior joins the under surface of the septum of the auricular canal. If the central part continued to grow upwards in the same plane it would join the left and posterior sides of the bulbus and so shut off the left ventricle from all arterial connexion, and both the aorta and the pulmonary artery would arise from the right ventricle. To avoid this the plane of the ventricular septum becomes altered. The concavity of the crescent, which still allows of communication between the two ventricles, is situated posteriorly and underneath the posterior part of the bulbus arteriosus. On the anterior upgrowth of the ventricular septum, which is fused with the left wall of the bulbus, a tubercle develops and grows backwards and to the right along the right border of the ventricular septum, ultimately joining the right posterior wall of the bulbus, and with this ridge the septum of the bulb joins, so connecting the left ventricle and the posterior vessel of the bulb, the aorta vera.

The base of the fully formed ventricular septum requires a little more detailed description. Most of it is thick and muscular but in one part it is thin—the membranous space. Viewed from the left ventricle this part is lozenge-shaped and lies beneath the anterior and right posterior aortic cusps which form the upper margins, while the edges below are formed posteriorly by the insertion of the anterior cusp of the mitral valve, and in front by the posterior edge of the anterior part of the septum. Looked at from the right side the membranous space is not in relation to the pulmonary artery but is situated underneath the internal cusp of the tricuspid valve. The exact relationship varies. The insertion of the cusp is sometimes beneath the membranous space, sometimes above it; most commonly it is related to its centre and corresponds on the left side with a line drawn immediately below the aortic cusps, dividing the lozenge into two more or less equal triangles (Pelvet [1]).

[1] Moussous: Maladies Congénitales du Cœur, p. 33. Paris, 1895.

The relation of the internal cusp to the membranous space varies considerably in the normal heart. A needle introduced from the left side into the centre of the membranous space always transfixes some part of the cusp, most frequently its anterior extremity and only rarely its centre. In none of the fresh specimens which we have examined, however, did the needle perforate the wall anterior to the cusp. The origin of the membranous space is somewhat obscure. It cannot develop from the septum of the bulb as it has been found present when the bulbus arteriosus was undivided (Moussous). It probably arises from the right posterior wall of the bulbus.

The anterior part of the septal base, that in front of the membranous space, may be divided into two parts. That underlying the left half of the anterior and the right half of the left posterior aortic cusps is not in relation with the pulmonary artery but with the infundibulum and the wall here is partly composed of infundibular muscle (posterior part of anterior septum). The part in front of this (anterior part of anterior septum) is, however, in relation to the pulmonary artery and its muscle is derived from both ventricles.

The *ductus arteriosus*, a survival of the distal part of the left fifth branchial arch, normally remains patent for some weeks or months after birth and during intra-uterine life conveys some blood from the pulmonary artery into the descending aorta.

CASE 1.—The patient was a child, aged two years and nine months. The following is a summary of the conditions found at the post-mortem examination: acute pneumonia, patent foramen ovale of considerable size, and chronic mitral and tricuspid endocarditis. The heart as a whole was distinctly enlarged, this being due to hypertrophy and dilatation of the right auricle and ventricle. Both the mitral and tricuspid orifices were dilated, and there were in addition slight evidences of chronic endocarditis of both valves. The arterial valves were competent. The fenestra ovalis as viewed from the right side was larger than usual (measurement = 2 centimetres). Its normal boundaries were badly defined, especially in the postero-superior and antero-inferior quadrants, the latter being thinned and fibrous. The valve, which was enlarged and thickened, was defective anteriorly, leaving an ellipsoid aperture, measuring 9 millimetres in its longer diameter. Viewed from the left side, the valve exhibited a marked fibrous reticulation. The endothelial coat of the left auricle was considerably thickened, especially opposite the foramen ovale.

A persistent communication between the auricles may be due to two different causes; it may arise from want of organic adhesion between the two walls of the foramen ovale (non-closure of the duct), or it may result from mal-development of the septa. Either the primary or the secondary septum may be at fault. In this case the valve of the foramen, the derivative of the primary septum, seemed well-developed, while the anterior wall of the right side of the orifice was attenuated and there was no vestige of the Eustachian valve, so that the defect seemed to be related to a mal-development of the secondary septum.

CASE 2.—The patient was a child, aged two years. At the post-mortem examination an aperture in the ventricular septum was found. The heart was not noticeably enlarged. The right ventricle with the exception of the infundibular portion was both dilated and hypertrophied. The infundibulum was small and its muscle was poorly developed. There was a marked deficiency at the base of the interventricular septum, an aperture being left which measured no less than 1·2 centimetres antero-posteriorly. It was limited above by the right half of the anterior aortic cusp and the anterior half of the right posterior cusp. The anterior mitral curtain did not arise from any portion of the wall of the aperture; this curtain was related basally to a small portion of the right posterior and to the whole of the left posterior aortic cusp. The aortic orifice opened directly into the left ventricle. There was a very small oblique opening in the foramen ovale (non-closure) but so oblique and minute that reflux seemed impossible. The right anterior cusp of the pulmonary valve presented an anomalous condition—a small, somewhat elongated sac depending from the middle of its attached surface and communicating with the cavity of the cusp by a narrow neck.

Defects at the base of the ventricular septum are, according to Rokitansky, most frequently related to the posterior part of the anterior septum, the membranous space sometimes sharing in the fault. The aorta in these cases is

usually displaced towards the right and slightly twisted on its own axis, so that its relations are altered, the right side moving forwards and the left side backwards. In Cases 2 and 5 the aperture in the septum lay underneath the anterior and right posterior cusps—i.e., in the position normally occupied by the membranous septum. The relations of the other parts, however, were altered. The anterior mitral cusp, which normally is inserted almost wholly beneath the right posterior aortic cusp, was related mainly to the left posterior, so that although no very evident membranous septum was present, it would probably have occupied a position further back than is usually the case. When looked at from the right side the aperture was found to have little connexion with the internal cusp of the tricuspid valve, which was inserted further back, only its anterior margin being related to the aperture. (One of us has examined an adult heart in which a minute aperture was present in the middle of the membranous septum. The internal cusp of the tricuspid valve was situated directly over the opening, and its central portion, which was immediately opposite, was much thickened.) The size of the aperture in both cases was large and distinctly in excess of that which one would attribute to a mere deficiency of the pars membranacea in such small hearts. In both cases the infundibulum was narrow and imperfectly developed. We consider, therefore, that in these cases the posterior part of the anterior septum was in default, the membranous part perhaps also sharing in the defect.

CASE 3.—The patient was a child, aged two months. The following is a summary of the conditions found at the post-mortem examination: transposition of the aorta and pulmonary artery, patency of the foramen ovale and the ductus arteriosus, and anomalous origin of the left common carotid artery. The heart was considerably increased in size. Its apex was formed mainly, but not entirely, by the left ventricle. The right auricle and ventricle were considerably dilated and, in addition, hypertrophied. As the heart lay *in situ* the aorta and pulmonary artery were seen to be transposed. The aorta was a large and thick-walled vessel, emerging from the right ventricle while the pulmonary

FIG. 1.

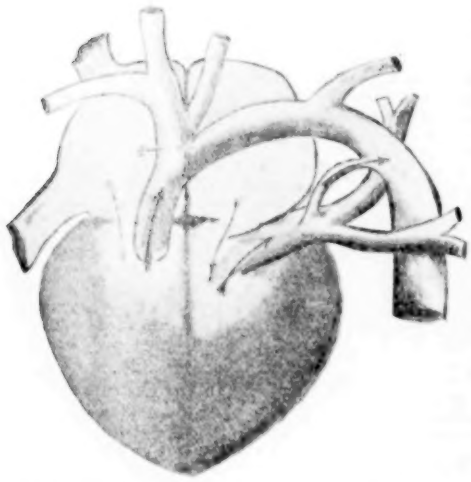


Diagram representing the course of the circulation in Case 3. The increased size of the aorta below the junction of the ductus arteriosus should be noted, and the origin of the left common carotid artery from the innominate artery.

artery originated from the left. The superior and inferior venæ cavæ opened as normally into the right auricle. The foramen ovale was patent (non-closure) and must have permitted interauricular communication. The interventricular septum was intact. The aortic orifice was somewhat stenosed, the cusps, however, appearing normal. The aorta did not issue directly from the infundibulum which projected as a pouch towards the left. In consequence the relations of the aortic and tricuspid orifices were altered, the opening of the latter, although posterior, being to the septal side. The coronary arteries arose from the two posterior aortic cusps. The ascending aorta was somewhat more to the right than usual. The innominate artery arising in its usual situation gave rise near its origin to the left common carotid artery. The left subclavian artery arose in its normal situation. The ductus arteriosus, a prominent structure with thick elastic walls and half an inch long, was patent throughout (diameter, four millimetres) and below its origin the aorta was distinctly larger than above. The left auricle received the pulmonary veins which were normal in number and appearance. The left ventricle was larger than normal and its walls were hypertrophied. The pulmonary artery arose from it, behind and somewhat to the left of the aorta, and was the larger vessel of the two. The ductus arteriosus arose from the pulmonary artery before its bifurcation.

The altered relationship of the great vessels in Case 3 is due to an error in the rotation of the bulbar septum. This partition, originally developed sagittally, in its downward growth undergoes normally a rotation towards the right so that the left trunk becomes anterior. If the rotation took place in the opposite direction the right vessel would come to the front. The orifice of the ductus arteriosus is directed downwards into the aorta and the subsequent increase in calibre of this latter vessel shows that it must have received some blood from the pulmonary artery. The non-closure of the foramen ovale would necessarily result from the obstruction offered to the exit of blood from the right ventricle. It is interesting to notice that the coronary arteries arose from the right ventricular vessel and from the posterior cusps—i.e., those related to the bulbar septum. We have only seen one other heart with origin of coronary arteries from the right ventricular vessel. In this case the right artery arose from the anterior sinus of Valsalva, while the left sprang from behind the left anterior cusp of the pulmonary artery. No other congenital defect was present in this case.

St. John Brooks[2] has recorded two cases in each of which a coronary artery arose from the pulmonary trunk. In one its branches were distributed to the pulmonary artery and to the right ventricle, but in the other it supplied no branches to the heart but entered at once a cirsoid mass of dilated vessels around the pulmonary artery where it was joined by branches from the right coronary, the left subclavian, and the transverse arch of the aorta. In both cases the abnormal vessel arose from the right anterior sinus. He quotes W. Krause,[3] who has described a case similar to his first, save that the artery arose from the left anterior sinus. The abnormal origin of the left common carotid is also the result of mal-development. The fourth right branchial arch is the embryonic representative of the innominate artery, the third arch being the precursor of the internal carotid. In ordinary circumstances the original ventral vessel is completely separated into two arteries between the first, second, and third branchial arches. An incomplete separation of the vessel, only including the first and second arches, would explain this abnormality.

CASE 4.—The patient was an infant, aged three months. The following is a summary of the condition found at the post-mortem examination: stenosis of the pulmonary artery and patency of the foramen ovale and the ductus arteriosus. The heart was very considerably enlarged from pure hypertrophy, in which both ventricles participated, the right to a greater degree than the left. The wall of the right auricle was hypertrophied. The venæ cavæ were normal. The fenestra ovalis was large, measuring from five to six millimetres, and somewhat sacculated and the aperture was not closed. It was, however, largely covered by the valve and the appearances did not suggest any considerable mixture of the auricular currents. The tricuspid valve was normal. The wall of the right ventricle was greatly hypertrophied. The infundibulum was considerably enlarged. The endocardium generally was thickened and opaque, this being most marked towards the conus. The interventricular septum was intact. The pulmonary valves had coalesced along their margins and formed a diaphragm, in the centre of which a minute aperture was situated. Viewed from either side however, the outline of the cusps was distinctly visible and they were greatly thickened so that the diaphragm was tough and resistant. The trunk of the pulmonary artery immediately beyond the orifice was of

[2] Journal of Anatomy and Physiology, London, 1886, vol. xx., p. 26.
[3] W. Krause: Zeitschrift für Rationelle Medicin, 1865, Band xxiv.

normal dimensions. The ductus arteriosus was patent and a fine probe could be passed through it into the aorta. The branches of the pulmonary artery were very small and the finer ramifications in the lung were insignificant. (The pulmonary veins, however, as displayed in a section of the lung; were of considerable size.) The wall of the left auricle was hypertrophied. The mitral valve was normal. The

FIG. 2.

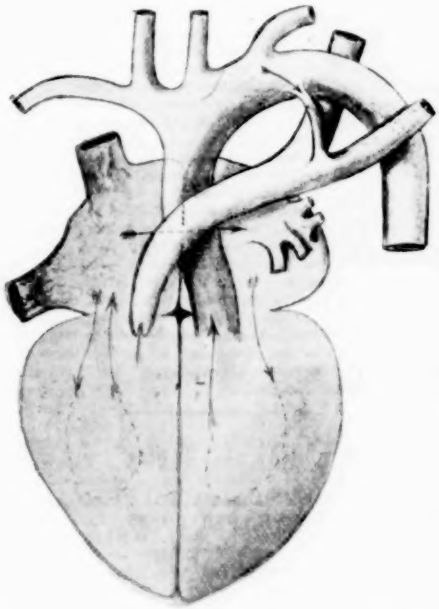


Diagram representing the course of the circulation in Case 4.

left ventricle was dilated as well as hypertrophied. The aortic valves were normal. The aorta itself was distinctly dilated and much larger than the pulmonary artery. Its cervical branches were normal. The ductus arteriosus was short. Its opening was quite distinct but was half concealed by pale thrombus which, adherent towards the left side of the opening, was non-adherent elsewhere and had been capable of acting in a hinged fashion. A small rope of more recent thrombus passed downwards into the arterial duct. It seemed probable that until a very short time before death blood must have passed by this channel into the pulmonary artery. The calibre of the aorta below the ductus was not increased.

In this case the prominent fact is the extreme stenosis of the pulmonary valve, the infundibulum being well developed, perhaps even larger than one would expect. It is difficult to find a satisfactory explanation of the thickening of the endocardium in the right ventricle. If the stenosis were due to an acute valvulitis an acute mural inflammation might have succeeded and involved the ventricular wall but in all the cases of mural endocarditis which we have seen in the adult the distribution has been patchy, with but a small portion of the wall involved. There was no evidence of inflammation in any of the other valves. The tension of the blood in the right ventricle must in this case have been great, judging from the thickness of the wall, and we are inclined to consider the endocardial thickening to be the result of the high intraventricular tension. (The endocardium of the left auricle is always thickened in cases of pronounced mitral stenosis.) The condition, too, was most marked in the infundibulum where the greatest stress would naturally fall. The objection to this view is that similar changes might be expected to have occurred in the right auricle where the blood tension must have been almost equal to that in the ventricles, but no such change had taken place. The patency of the foramen ovale, however, may have sufficiently reduced the intra-auricular pressure. The pulmonary stenosis must have occurred comparatively late in intra-uterine life, at any rate after the second month, as the ventricular septum was complete. The non-closure of the foramen ovale and the patency of the ductus arteriosus are the necessary sequels of the pulmonary obstruction. The disproportion in size noted between the pulmonary arteries and veins suggests that a portion of the blood traversing the pulmonary circulation had been the result of aortic anastomosis (bronchial arteries, &c.). It is unfortunate that the examination of these was omitted. The origin of the pulmonary stenosis is obscure and we are unable to express an opinion as to whether it was due to endocarditis or to imperfect valve septation.

CASE 5.—(The clinical details have unfortunately been lost.) The following is a summary of the cardiac condition found at the post-mortem examination: pulmonary stenosis, aperture in the ventricular septum, patent foramen ovale, and probable patency of the ductus arteriosus. The heart as a whole was enlarged, the increase in size being almost entirely due to hypertrophy of the right side, the ventricle of which formed the apex. The right auricle was dilated and its wall was thickened. The foramen ovale was patent (non-closure). The tricuspid valve was slightly thickened. The cavity of the right ventricle was greatly increased in size but the infundibulum was smaller than normal. The endocardium here was slightly opaque and thickened. The pulmonary artery was very small, being only about one-sixth of the aorta in diameter and it was situated almost entirely to the left of the latter vessel, though in an anterior plane. The pulmonary valves, two in number, showed an obliquely placed slit when viewed from beneath. The anterior cusp was large and thickened; the posterior was not quite so large and was incompletely divided by a small tubercle at the bottom of the sinus. The cross section of the branches of the pulmonary artery taken together was considerably greater than that of the main trunk. The ductus arteriosus arose from the left branch of the pulmonary artery. The septum of the ventricle was incomplete, an aperture measuring from 1·3 centimetres being situated immediately in front of

FIG. 3.

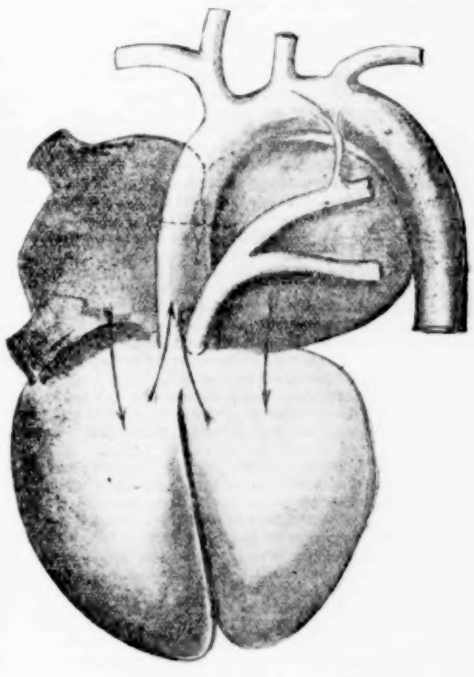


Diagram representing the course of the circulation in Case 5. The disproportion in size between the pulmonary artery and the aorta should be noted, and the displacement of the latter vessel to the right. The aortic orifice is so placed as to receive blood from both ventricles.

the septal cusp of the tricuspid valve. The left auricle was much smaller than the right and its wall was not thinned. The mitral valve was normal. The left ventricle did not appear to be atrophied. The aorta was very large and was displaced to the right side. Its cervical branches were normal. The ductus arteriosus—nearly three-quarters of an inch in length—arose from the concavity of the arch just beyond the origin of the left subclavian artery. It was pervious for three-quarters of its length, the remaining fourth being occluded by recent clot. The calibre of the aorta did not seem to be altered beyond the origin of the ductus. The aortic valves were normal. The aperture in the ventricular septum was mainly related to the anterior cusp of the aorta and only slightly to the right posterior cusp. The anterior cusp of the mitral valve arose almost wholly beneath the left posterior aortic cusp. The dilated aorta was related not only to the left ventricle but also to the right and rode *à cheval* over the septum. The bulk of the contents of both ventricles would thus probably enter this vessel.

The striking fact in this case is the stenosis of the pulmonary artery and infundibulum, associated with a defect in the ventricular septum. The non-closure of the foramen ovale appears to be of secondary importance. Although the ductus arteriosus was occluded the greater calibre of the branches of the pulmonary artery taken together as compared with that of the trunk, as well as the newly formed character of the congulum in the arterial duct, would seem to indicate that up to within a very short time of death blood had passed through this channel into the pulmonary artery. Case 5 differs from Case 4 in that the ventricular septum was incomplete and the infundibulum as well as the pulmonary orifice was greatly narrowed.

The pathogeny of congenital heart disease has been much discussed and it is over cases of this kind that the greatest amount of controversy has arisen. According to Lancereaux [4] "La tératologie du cœur n'est autre que la pathologie de cet organe pendant le cours de la vie intra-utérine"; Rokitansky and others, on the contrary, maintain that all the defects which occur are the result of mal-development of the various septa. The former thus considers that endocarditis during fœtal life is the *causa causans* and the latter authors that if endocarditis occurs it does so at a late period in the case and attacks particular regions of the heart because the vital resistance of these is diminished owing to their vicious development (Moussous). If an endocarditis causes a pulmonary stenosis before the end of the second month the ventricular septum is still incomplete; the blood in the right ventricle, having difficulty in passing into the pulmonary artery, passes into the left ventricle and so prevents the completion of the partition. The increased blood pressure in the right ventricle leads to dilatation of the cavity and a displacement of the septum occurs towards the left, with in consequence an alteration in the relations of the aorta to the ventricular septum. The increased quantity of blood thrown into the aorta necessarily causes its dilatation while the smaller quantity entering the pulmonary artery explains the smallness of the infundibulum. The initial lesion of the other authors is an irregular development of the bulbar septum which originates more to the left than usual and so produces an aorta which is larger than normal and situated more to the right. From the malposition and increased size of the aorta the anterior portion of the ventricular septum is unable to attain its full development and in consequence the septum remains incomplete and the infundibulum small. Any defect at the orifice of the pulmonary artery is the result of mal-development of the semilunar valves.

The most weighty arguments against Lancereaux's views on the causation of this particular combination of defects—arguments which we consider conclusive—may be stated as follows. The septum of the bulb is completed towards the end of the sixth or seventh week and the ventricular septum is finished a very few days later, so that endocarditis, to produce this malformation, must occur within one particular fortnight (the seventh and eighth weeks of utero gestation). The combination of defects which we are considering is one of those most frequently met with, and it is almost inconceivable that endocarditis should arise in so great a number of instances within one special fortnight of intra-uterine life.

The pulmonary artery at the period under consideration is very minute and in close apposition to the aorta, and any inflammatory process affecting the one to such an extent as to obliterate even partially its channel would certainly also affect the other; but the aorta rarely shows a corresponding lesion. In adult life, moreover, an endocarditis never leads to any marked degree of obstruction of orifices during the acute stage and months always elapse before such a condition obtains. The size of the channels in intra-uterine life is, it is true, small but even here the time allowed is too short to cause any marked constriction. Finally, in many cases the most careful microscopical examination of the stenosed pulmonary valves has failed to show any evidences of inflammatory action (Cadet de Gassicourt [5]).

Such cases as Case 3 are only explicable on the ground of mal-development, and of course it must be admitted that endocarditis does occur during intra-uterine life. In a few cases it may lead to certain anomalies, such as non-closure of the foramen ovale or patent ductus arteriosus, but we are convinced that such cases are rare and that the large majority of cases of congenital heart disease are due to a mal-development of the various septa. In this particular case (Case 5) the origin cannot be doubted, as the two cusps at the pulmonary orifice could only be produced by mal-development during fœtal life. Such abnormalities are not uncommonly met with, and we have seen several; the cusps may be more numerous than usual, as well as fewer. No gross alteration in the development of the heart will, however, result unless the valve is also mechanically imperfect.

We have pleasure in acknowledging our indebtedness to Dr. G. S. Middleton for permission to publish these records of cases which occurred in his wards at the Royal Hospital for Sick Children, Glasgow.

[4] Moussous, op. cit., p. 132.

[5] Ibid., p. 155.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

REMARKS ON A CASE OF "FACIO-HYPOGLOSSAL ANASTOMOSIS" (THE KÖRTE-BALLANCE OPERATION).

BY JAMES H. NICOLL, M.B., C.M. GLASG.,
PROFESSOR OF SURGERY IN THE ANDERSONIAN COLLEGE, GLASGOW, ETC.

THE patient, a married woman, was operated on on July 30th of this year for the relief of old-standing and severe facial convulsive tic. The facial and hypoglossal nerves were identified, lying respectively above and below the posterior belly of the digastric. That muscle having been excised the facial nerve was divided close to the stylo-mastoid foramen and the hypoglossal near the occipital artery and united end to end. The wound healed by first intention and the patient is now under electric treatment for the facial muscles. At present both the right side of the face and the right side of the tongue are paralysed. The condition of the tongue appears to cause the patient little inconvenience in feeding or speaking.

The possible relief of peripheral facial paralysis has been recently brought to the front, largely by the pioneer efforts of Ballance. In a recent paper [1] on the subject he expresses the opinion that the operation of choice may be found to be facio-hypoglossal anastomosis, and in a subsequent communication [2] he points out that he has found that his independent and original procedure had suggested itself also to Körte [3] who had put the idea into practice in a case recorded.

Ballance's suggestion is one of prime importance, and will be anxiously tested in practice. In this connexion the foregoing case raises certain questions to some of which time will supply the answer. Others must be decided by further operative trial in this and other cases. They may be briefly formulated:—

A. *Face.*—1. Will movement return in the facial muscles? 2. If so, will such movement be "associated" (tongue-

[1] Brit. Med. Jour., May 2nd, 1903.
[2] Ibid., May 30th, 1903.
[3] Deutsche Medicinische Wochenschrift, April 23rd, 1903.

face), or will "education of the cortex" secure dissociated voluntary movement?

B. *Tongue*.—In the event of the development of voluntary dissociated movement in the facial muscles the condition of the paralysed half of the tongue will raise further questions:

1. The end of the severed distal portion of the hypoglossal nerve has been left lying near the digastric tendon. What will be the effect of grafting that distal portion on the intact opposite hypoglossal? Such an operation is very easily performed on the cadaver. (The intact nerve is exposed by the incision—from one to one and a half inches in length—for ligature of the lingual artery. At that point, close above the hyoid bone, a pair of fine dressing or sinus forceps is pushed through the base of the tongue—hyoglossus and genio-hyoglossus—and the end of the divided nerve is grasped and brought through to the intact trunk.) Whatever the ultimate effect, will the primary results include a temporary paresis of the healthy nerve and, if so, will such paresis added to the paralysis on the other side involve any risk? It is difficult to believe that, with due delicacy in operating, paresis to any serious extent can arise. In the event of its occurrence its effects might be obviated by temporary fixation of the tongue to the floor of the mouth by anchoring sutures, and feeding by tube—nasal or oral. What would, in another case, be the ultimate effect of grafting half of the anterior part of the hypoglossal on the opposite nerve, and, at a subsequent period, grafting the other half and, at the same time, uniting the proximal part of the divided hypoglossal with the paralysed facial?

2. Can any use be made of the ansa hypoglossi? Operating on the cadaver it is possible to persuade oneself that one has been able to separate from the trunk of the hypoglossal, and to preserve intact, the upper limb of the ansa (descendens hypoglossi, &c.), and thus the entire loop; and after section of the hypoglossal trunk to graft the proximal end on the (paralysed) facial and the distal on the convexity of the intact ansa. In the case detailed above, however, this proved impracticable, the nerve strands tearing.

Glasgow.

A CASE OF INTUSSUSCEPTION.

BY JOHN EUSTACE WEBB, M.B., C.M. ABERD.,
SURGEON, R.N. (RETIRED).

ON Dec. 29th, 1902, on returning from a long country round, fatigued and hungry, I was met by a labouring man at my threshold who asked me to visit his female child, aged nine months, who had been taken suddenly ill at about 2 o'clock that afternoon. The child was screaming and evidently was in great pain; she had passed some blood by the bowel. I set off at once to travel a distance of five miles to the father's cottage. I had very little difficulty in coming to the conclusion that the case was one of intussusception. I informed the parents as to the gravity of the case and advised them to have an operation done with as little delay as possible. The parents having given their consent I returned home to make the necessary arrangements. By 6.30 P.M., with Dr. A. Adams and Miss Clarke, our Queen's Jubilee nurse, in a blinding snowstorm, I was on my way back to the cottage. On the journey we lost our road in the storm, and having to get out of the conveyance to seek the right way I unfortunately fell into a ditch, which was certainly not a good preliminary to a serious surgical operation. The child was placed on a hot-water bed, chloroform was administered, and the abdomen was prepared and opened in the middle line. The intussusception was found and it proved to be an invagination of the ileum into the cæcum. The in-turned bowel was fully six inches in length and reduction proved to be difficult. By 8.30 P.M. the operation was completed and the child was placed back in her cot. The mother was directed not to take the child up, to be very prompt and careful in the necessary "changing," and to feed her with milk and-water (one part to four parts) until she was again seen on the next day. There are no points of interest to relate with reference to the after-treatment of the case. Apparently the operation did not make any difference to the child—she slept all the following night and was ready to play and to laugh in the morning. The bowels acted on the second day after the operation and each day subsequently. The stitches were removed on the tenth day when the wound was entirely healed.

The points of interest in such a case are: (1) that the operation was performed within six hours of the commencement of the symptoms; (2) that a distance of 15 miles, in the severest weather, had to be driven before the necessary proceedings could be carried out; (3) that the work could not have been undertaken without the aid of the thoroughly trained nurse supported in the district; and (4) that the operation was performed in the poorest of dwellings, at night, in the middle of the winter, the only light available being that from an ordinary cottage lamp and a candle.

Looe.

NOTE ON A CASE OF RETENTION OF URINE FROM OCCLUSION, PROBABLY TRAUMATIC IN ORIGIN, OF THE MEATUS URINARIUS.

BY T. WILSON PARRY, M.A., M.B., B.C. CANTAB.

EARLY on the morning of August 23rd, 1903, a boy, aged two and a half years, was brought to me on account of his inability to pass urine. For a week previously his parents had noticed that he had had difficulty in micturating, the stream being thinner than usual and squirting in an upward direction rather than being passed in the ordinary way. 12 hours immediately preceding the present occasion he had passed a very small thin "squirt" of urine, but since then there had been absolute retention. A small crust-like "operculum" lay at the mouth of the meatus and this was removed by hot sponging and with the finger nail. I then inserted a probe but had to use force to pass it through the meatus, as the lips of the meatus had actually grown together. The probe having been passed and having dilated the orifice in its transit, a full free stream of urine was quickly voided and the boy was instantly relieved, showing that there was no obstruction anywhere else along the line of the urethra. Subsequent examination of the urine and inquiry into the history of the case elicited no information regarding the presence or the passing of stone. A lens revealed the fact that a little ring of raw surface was situated immediately inside the meatus. Last October, the mother told me, the patient had had some similar, though far slighter, trouble in the same place. From what I could gather he evidently had had a sore spot in the meatus, but he was put under treatment early and soon got all right again. I can only imagine that the little patient, who is of a somewhat excitable and restless disposition, had picked himself with his finger-nail during sleep and thus had produced a little wound which had taken on a strictural character. There was no history of worms.

This case seems to me to be interesting from its unique character rather than for any other reason and it is on this account that I have thought it not unworthy of being mentioned.

Hornsey-lane, N.

THE FINSEN LIGHT INSTITUTE AT COPENHAGEN.—The *Electrical Engineer* of Sept. 25th contains some account of the Finsen Light Institute at Copenhagen, forming part of a lecture delivered by Mr. W. J. Hammer before the American Institute of Electrical Engineers and the American Electro-chemical Society. The lecture dealt chiefly with the physical properties of radium, radio-active and fluorescent substances, and selenium. During the summer of 1902 Mr. Hammer spent some weeks in Copenhagen and took advantage of the opportunity to make himself acquainted with the appliances required for the therapeutic use of ultra-violet light. The light of the electric arc, he said, is much richer in ultra-violet rays than sunlight is and the proportion of these rays in the electric light can be increased by the use of special electrodes made of iron or aluminium, although Professor Finsen states that the rays obtained from carbon electrodes are the most efficacious because they penetrate more deeply than those given off by iron electrodes. The current used in the lamp has a strength of from 40 to 80 ampères and an electro-motive force of from 45 to 50 volts. The light is concentrated by a telescope containing four rock-crystal lenses which cut off most of the heat rays but allow the ultra-violet rays to pass; ordinary glass, on the other hand, cuts off almost all of the ultra-violet rays. Further concentration of the light and also expulsion of blood from the soft parts are effected by firmly pressing a plano-convex lens of rock crystal on the part to be treated.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

ROYAL EYE HOSPITAL, SOUTHWARK.

A CASE OF PERSISTENT SECONDARY HÆMORRHAGE AFTER ENUCLEATION OF THE EYEBALL FOR INTRA-OCULAR SARCOMA (HÆMOPHILIA).

(Under the care of Sir WILLIAM J. COLLINS.)

FOR the notes of the case we are indebted to Mr. Thomas E. Frazer-Toovey, house surgeon and registrar.

The patient, a man, aged 50 years, was admitted to the Royal Eye Hospital on May 27th, 1903, suffering from sarcoma (ciliary region) of the left eye. The following family history was elicited. The patient's father was alive and well but his mother was dead. The patient was the eldest of seven children, five of whom were still living. One brother had died from tuberculosis and a sister from diabetes. Not until after the operation were the following facts mentioned by the patient—viz., that he was said to have bled for days after birth (probably omphalorrhagia) and again whilst a youth after a blow on the nose hæmorrhage was sufficiently profuse to necessitate having both nares plugged. As a young man he had a cut at the back of his head which was sewn up but bleeding continued for about ten days. On another occasion he had a hæmorrhage for days after extraction of a lateral incisor. The youngest sister had had frequent epistaxes, but her children were not bleeders.

On June 3rd the patient was anæsthetised, chloroform being used, which he took well, but after the eye had been removed in the usual manner he evinced some signs of failing respiration, but soon rallied on pulling forward the tongue and lowering the head. Perhaps on this account there was but little hæmorrhage at the time of, or immediately following, the operation. At 6 P.M. on the same evening, as his pulse was weak, one-sixtieth of a grain of strychnine hydrochlorate was administered hypodermically. As the dressing was tinged with blood another pad and bandage were applied. At 1 A.M. on the next morning the wound had to be again dressed, as both pads and bandage were soaked through. The wound was examined and as there were no bleeding points that could be ligatured the edges of the conjunctiva were sutured by the house surgeon and a light bandage was applied. On the 5th the dressings were again soaked through. The hæmorrhage, although continuous, was not profuse. The wound looked very much puffed and clots were found in the orbital cavity. The left side of the face was œdematous from the supra-orbital ridges above, terminating abruptly in front of the external auditory meatus and extending below to the level of the inferior border of the zygomatic ridge. On the 6th the dressings were again soaked through after pressure bandages had been applied. At 12.15 P.M. the dressings had to be changed again. The wound was packed with gauze soaked in adrenalin hydrochlorate (1 in 1000) and ice was applied externally, but the bleeding was not arrested. At 9.45 P.M. chloroform was again administered, the wound was thoroughly explored, and the cavity was well douched with water (120° F.); the bleeding had been apparently stopped. The socket was very firmly packed with gauze soaked in adrenalin (1 in 1000), pads were applied, and a firm pressure bandage was put on. One-fifth of a grain of sulphate of morphia was administered. On the 7th it was ascertained that the patient had had a good night and there was no bleeding throughout the day. 20 minims of solution of extract of ergot were given every four hours. On the 8th the plug was removed and the orbital cavity was lightly packed with gauze. On the morning of the 9th the pads were again soaked with blood and plugging was resorted to again. Fifteen grains of chloride of calcium were given every four hours. On the 10th the dressings were again soaked. The patient complained of headache and the swelling at the side of the face seemed to be more œdematous and baggy. Tannic acid powder was applied locally and iced lead lotion, but the bleeding still persisted. At bedtime 40 minims of tincture of opium were administered. On the 11th the bleeding still persisted. The patient had had a good night's rest. On the 12th it was gathered that there had been very little bleeding during the night; it re-started, however, after the morning's dressing, but although it was continuous it was less than on the previous day. Tannic acid and iodoform were used locally. On the 13th the pads were again soaked through. The wound was packed with gauze soaked in lotio rubra. 20 grains of chloride of calcium were given every four hours. On the 14th the hæmorrhage tended to stop. The application of tannic acid and firm pressure was kept up and opium was administered. On the morning of the 15th there was very smart hæmorrhage. There had been bleeding mostly through the night. The wound was plugged with gauze soaked in oil of turpentine and firm pressure was applied. The bleeding then stopped. On the 16th there was no hæmorrhage all day. One drachm of hamamelis was given three times a day. On the 17th it was ascertained that during the night the dressings had become soaked through and a layer of wood-wool was applied so as not to disturb the dressings and pressure was kept up. On the 18th it was found that there had been no bleeding through the night. On dressing the wound a clot of the size of a pigeon's egg was seen to be lodged between the lids and blood was trickling from the sides. The wound was plugged with gauze wrung out in hot water and a light pressure bandage was put on. The patient was allowed to get up for a short while in the afternoon. The dressings were again soaked through and 30 minims of tincture of opium were administered at bedtime. On the 19th there was no hæmorrhage. On the 20th the dressings were again soaked through, so the wound was packed with Pengawar Djambi (the stem hairs of ferns principally of the genera Cibotium and Alsophila found in Sumatra and Java). The wound was dressed 24 hours afterwards; the plug was not soaked in blood. The wound bled no more and each day the socket was lightly plugged with cyanide gauze. On the 24th the conjunctiva which had tended to slough was removed with scissors, no bleeding taking place. The patient, who was now in excellent health and had gained half a pound in weight during the past ten days, left the institution on July 27th for a visit to the country, since when nothing has been heard about him.

Remarks by Mr. FRAZER-TOOVEY.—Cases of persistent bleeding after enucleation are happily rare and are therefore worthy of publication. The literature on the subject is scanty, few cases having been reported. Dr. T. E. D'Oench of New Jersey in a series of 500 successive enucleations of the eyeball in Dr. Knapp's practice mentions the case of one patient who bled profusely both at the operation and afterwards; the eye in this case was removed for melano-sarcoma. Mr. E. F. Drake-Brockman in the Ophthalmic Reports[1] mentions a case of severe recurrent hæmorrhage after excision of the eye in a scorbutic subject.

GENERAL HOSPITAL, BIRMINGHAM.

A CASE OF ACUTE SUPPURATION IN THE MASTOID ANTRUM IN THE COURSE OF MIDDLE-EAR DISEASE, FOLLOWED BY INFECTIVE THROMBOSIS OF THE LATERAL SINUS AND CEREBRAL ABSCESS; OPERATION AND RECOVERY.

(Under the care of Mr. GEORGE HEATON.)

A MAN, aged 31 years, was admitted into the General Hospital, Birmingham, on Oct. 22nd, 1902, suffering from headache and delirium in the course of middle-ear disease. The history of his present condition was as follows. He had had an occasional discharge from the right ear as long as he could remember. Nine weeks before admission he began to have pain in the right ear and the right side of the head. He had for three or four months previously been occasionally strange in his mind according to the account of his relatives. During this time there was no discharge from the ear and the meatus on the right side was plugged with cerumen. There was no vomiting. Two and a half weeks before admission he began to have periodic attacks of occipital

[1] Ophthalmic Review, 1886, p. 40-42.

headache and to be occasionally delirious at night. Five days before admission an acutely tender swelling appeared behind the right ear, he became feverish, and the pain in the head became worse. During the onset of his illness he was occasionally slightly sick and shivered, but there was no marked rigor. On admission he was found to be a tall, thin, dark-complexioned man. His face was pale and had an earthy tinge and had the appearance of a man who was extremely ill. The temperature was 102° F. and the pulse was 86, small and regular. He was delirious at times but could be roused occasionally, though he quickly relapsed into a sleepy condition. The deep reflexes were exaggerated. With regard to the condition of the eyes, both pupils reacted to light. The right pupil was somewhat smaller than the left. Dr. D. C. Lloyd Owen reported as follows on the condition of the fundi: "On the left side neuro-papillitis, considerable œdema of the disc, and numerous striated hæmorrhages in the course of the vessels. On the right side the condition was similar but not so marked." The condition of the ears was as follows. The patient was practically quite deaf. There was intense pain all over the right side of the head. The right ear was pushed downwards, outwards, and forwards by an inflammatory swelling behind it. The meatus contained masses of inspissated pus and cerumen. The mouth was dry, the tongue was covered with a thick brown fur, and the breath was extremely fœtid. The bowels were constipated. No abnormal physical signs were discovered in the chest. There was no muscular paralysis. The urine was passed involuntarily.

The patient was anæsthetised and a crescentic incision was made into the swelling behind the right ear. A large quantity of foul-smelling pus was evacuated and the periosteum was found to be separated from the mastoid. On Oct. 24th the patient was in much the same condition. He had been delirious during the night, but was more sensible in the morning. He would answer questions when spoken to in a very loud voice, but then only very slowly. His temperature was 97·8° and his pulse was 60. The tenderness had extended below the mastoid process in the course of the internal jugular vein. The bowels were still constipated and the breath was extremely foul.

A second operation was performed. The patient was anæsthetised with chloroform, the head was shaved, and a large flap of scalp was reflected from behind the ear. The mastoid emissary vein was found to be plugged with a soft thrombus. The mastoid antrum was opened; it contained a quantity of foul sanious pus which pulsated forcibly with each heart beat. A large area of bone was then removed with the chisel, exposing the dura mater covering the brain, the sigmoid sinus, and the cerebellum. The bone was much thickened and densely sclerosed. The groove for the sigmoid sinus was filled with breaking-down granulation tissue and the sinus itself was found thrombosed. The sinus was freely opened and a quantity of breaking-down blood clot was removed. The clot appeared to extend a considerable distance backwards and there was but little hæmorrhage. The sinus was then wiped out with perchloride of mercury lotion and packed with iodoform gauze. The wound was closed at its extremities but was left open in the centre.

For a few days the patient seemed to improve. The temperature remained normal, his pulse varied between 70 and 65, and he was more rational. There was no vomiting and there were no rigors. On the 29th he had become much more drowsy, his temperature had fallen to 97° and his pulse to below 60. He could not be roused at all and refused to take all nourishment.

A third operation was performed. An anæsthetic was again administered, the wound was reopened, and more bone was removed. The lateral sinus was opened more freely and more blood clot was removed. The cerebrum was then explored in the region of the temporo-sphenoidal lobes with an exploring syringe in five places. No pus was found but in one of the explorations the lateral ventricle was tapped and a syringeful of clear fluid was drawn off. The cerebellum was in the same way explored three times with a negative result. The syringe was firally thrust in a direction inwards and directly backwards in the direction of the angular gyrus and an abscess cavity was entered at a depth of two and a half inches. One and a half ounces of dark brown very fœtid pus were evacuated and the tension of the brain at once became less and its pulsation more marked. The pulse rose immediately to 90. A small rubber drainage-tube was left in the abscess cavity and the wound was again closed at its extremities. On the 30th the patient was very restless all night, continually getting out of bed. The temperature in the morning was 98° and the pulse was 84. He was quite rational and began to take an interest in things around him in the ward. His after-history was uneventful. The abscess cavity was daily irrigated with boric acid lotion and the tube was removed on Nov. 16th. The headache entirely disappeared and the appetite rapidly improved. He was allowed to get up on the 19th and left the hospital on Dec. 2nd with the wound soundly healed.

The pus from the cerebral abscess was examined by Dr. J. G. Emanuel, the hospital pathologist, who reported as follows: "The pus inoculated on to agar produced an opaque film which consisted of a pure growth of short thick bacilli, freely mobile, tending to form chains and decolourised by Gram's method. The clear fluid from the lateral ventricle inoculated on to agar produced large discrete white colonies which consisted of bacilli with the same characteristics as those obtained from the pus."

Remarks by Mr. HEATON.—The coincidence of infective thrombosis of a cranial sinus and a cerebral abscess makes the case worth recording. Other observers have recorded one or two similar cases, and Professor Macewen in his work on "Pyogenic Diseases of the Brain" gives clinical notes of several. The presence of two such serious complications of middle-ear disease, of course, renders the prognosis a very grave one, but the patient in the above case was a fortunate exception to the general rule of such cases. The thrombosis in this case had probably taken place somewhat slowly and the thrombus had only broken down in its centre. For this reason I did not think it necessary to ligature the internal jugular vein in the neck, as I have generally done in such cases. The same micro-organism was found in the pus from the lateral sinus and in that from the brain abscess, and a pure culture of it was obtained from the clear fluid drawn from the lateral ventricle.

Reviews and Notices of Books.

Clinical Treatises on the Pathology and Therapy of Disorders of Metabolism and Nutrition. By Professor CARL VON NOORDEN, Senior Physician to the City Hospital in Frankfort. Authorised American edition translated under the direction of Dr. BOARDMAN REED, Professor of Diseases of the Gastro-Intestinal Tract, Hygiene, and Climatology, Department of Medicine, Temple College, Philadelphia. Part I., Obesity; the Indications for Reduction Cures. Part II., Nephritis. New York: E. B. Treat and Co. 1903. Part I., pp. 59, price 50 cents. Part II., pp. 112, price $1.

Professor von Noorden has been occupied for many years in an exhaustive study of the disorders of metabolism and nutrition. The result of this work has been indicated in a number of short essays published in various periodicals and in several larger monographs. He now proposes to establish a medium for the publication in collected form of the results of the further experience of himself and his pupils in the pathology and therapy of these disorders. The first two volumes of the series are now before us.

The essay on the indications for "reduction cures" in cases of obesity is of considerable interest but disappointing in that no suggestions are made as to the routine of treatment which should be adopted. In our opinion it would have been more useful had the scope of the volume been extended and a description given of the principal forms of "cures" which Professor von Noorden has found to be satisfactory. There is frequently some difficulty in deciding as to whether it is desirable to subject a patient to a course of treatment to reduce obesity when he or she is the subject of organic disease; especially is this the case when the circulatory system is at fault. The most satisfactory and the most suitable cases for such treatment are those in which only slight disorders of circulation are present and at the same time when only a moderate degree of obesity exists. In advanced cases of cardiac disease a "reduction cure" is useless. The difficulty lies, as Professor von Noorden points

out, in deciding as to those cases which are beyond repair. His remarks on this subject are well worthy of note.

The second volume of the series is devoted to a consideration of nephritis, mainly in reference to treatment. Professor von Noorden's handling of the subject is bold, original, and somewhat iconoclastic. He entirely disagrees with many of the views now generally held. For instance, he denies that the "light meats" are safer than the "dark ones" in nephritis. He maintains that clinical experience is much more important "than all the investigations that at best extend over very short periods of time." He states that he has been studying numerous cases of nephritis for many years and has found that there is no reasonable objection to the administration of "dark meats" to patients with contracted kidneys. Without disputing these statements we consider that they require corroboration before they can be generally accepted. The results obtained by confining subjects of chronic interstitial nephritis to "white meats" have been very satisfactory, but at the same time if the "dark meats" also can be given with safety the variety in diet would certainly be welcomed by the patients. Professor von Noorden's views on the amount of water which may be taken by patients with contracted kideys are also interesting. He believes that in many cases, especially in those in which cardiac disease is also present, a sensible restriction of water is frequently followed by a material change for the better. This little book is well worth reading and Dr. A. C. Crofton has translated the work in a very creditable manner.

A Manual of Ophthalmic Practice. By CHARLES HIGGENS, F.R.C.S. Eng., Ophthalmic Surgeon to Guy's Hospital. Second edition, revised and edited by ARTHUR W. ORMOND, F.R.C.S. Eng., Assistant Surgeon, Royal Eye Hospital, Southwark. London: H. K. Lewis. 1903. Pp. 375. Price 7*s.* 6*d.*

MR. HIGGENS'S manual contains a simple and straightforward account of the principal diseases of the eye and is well adapted for those students who are commencing their work in the ophthalmic wards of a hospital. It is divided into two parts, the first five chapters of the first part, according to time-honoured custom, being devoted to the optical relations of the eye, to errors of refraction, to the mode in which the examination of the eye should be conducted, and to the affections of the ocular muscles. The following chapters deal with the eyelids, conjunctiva, sclerotic and cornea, lens and iris, and with sympathetic ophthalmia and glaucoma. In the second part the various operations are described.

In a volume of this size much is necessarily omitted. It is taken for granted that the reader is acquainted with the general anatomy and physiology of the eye and there is no space for pathology, nor are there any details given of the various micro-organisms that affect the conjunctiva. The relations of the teeth to the eye and the importance of attention to the bowels and the removal of ascarides or lumbrici in cases of phlyctenular ophthalmia and even of strabismus might have been mentioned with advantage as serving to impress upon the young surgeon the intimate connexion that disorders of the eye have with other affections of the system. There does not appear to be any notice of protargol which has been so warmly recommended by some of the ophthalmic surgeons on the continent. Mr. Higgens recommends eclecticism in the operation for cataract but when all conditions are favourable seems to prefer extraction without iridectomy, the conjunctiva, the cornea, and the iris being rendered insensitive by cocaine. His large experience makes his opinion of great weight. Throughout the work the advice given in regard to treatment seems to be sensible and judicious.

LIBRARY TABLE.

Atlas and Epitome of Traumatic Fractures and Dislocations. By Dr. H. HELFERICH, Professor of Surgery at the Royal University, Greifswald, Prussia. Authorised translation from the German, edited by JOSEPH C. BLOODGOOD, M.D., Associate in Surgery, Johns Hopkins University, Baltimore, Maryland. Fifth edition, revised and enlarged. With 216 Coloured Illustrations on 64 Lithographic Plates and 190 Figures in the Text. London and Philadelphia: W. B. Saunders and Co. 1902. Pp. 353. Price 13*s.* net.—Two translations of Professor Helferich's writings on Fractures and Dislocations have appeared in English. This translation is made from the fifth German edition and is accurate and readable. The valuable work of Professor Helferich is so well known that it needs no commendation from us, but we may speak in high praise of the manner in which the coloured illustrations have been reproduced in this edition. Dr. Bloodgood has interpolated here and there useful remarks and annotations which clear up some obscurities and peculiarities of German nomenclature and practice. To the student and to those engaged in practice we can warmly recommend this book, as it treats specially of the more commonly occurring forms of fracture and dislocation and does not devote unnecessary attention to rare varieties. The treatment is given with sufficient fulness to enable the surgeon to carry it out satisfactorily. This volume is one of the most valuable of the excellent series to which it belongs.

Operative Surgery. By HERBERT W. ALLINGHAM, F.R.C.S. Eng., Surgeon to the Household of His Majesty the King; Surgeon-in-Ordinary to His Royal Highness the Prince of Wales; Senior Assistant Surgeon and Lecturer on Operative Surgery at St. George's Hospital; Consulting Surgeon to the Surgical Aid Society, &c. London: Baillière, Tindall, and Cox. 1903. Pp. 367. Price 7*s.* 6*d.* net.—This work is intended not only for students engaged on operative surgery on the dead body but also for the use of those who desire to look up the leading features of an operation before performing it. We consider that these aims of the author have been very successfully carried out, for while it will in no way tend to supersede such a work as Jacobson and Steward's Operations of Surgery, yet it is well fitted to assist the junior members of the profession in gaining a knowledge of all the ordinary, and most of the rarer, operations. In the case of each operation a list of "memoranda" is provided and these should prove of value, for in them the specially important points are emphasised. The diagrams are numerous and good.

Elementary Bacteriology. By M. L. DHINGRA, M.D., C.M. Edin. London: Longmans, Green, and Co. 1903. Crown 8vo, pp. 145. With Coloured Frontispiece and 26 Figures in the text. Price 3*s.*—In the preface to this book the author sets forth his aims in these terms: "An attempt has been made in the following pages to represent in a concise manner the fundamental principles of bacteriology. As will be seen from the contents the material has been so selected and arranged as to meet the ordinary requirements of Indian students and practitioners." A careful perusal of the book leaves the impression that the author has a by no means high opinion of these "ordinary requirements." The book is divided into two parts. The first, comprising some 57 pages, deals in a somewhat sketchy manner with the morphology and general biology of bacteria, the theory of spontaneous generation, fermentation, putrefaction, antiseptics and disinfectants, and the preservation of foodstuffs. The second part, of hardly greater length than the first, gives details, more or less accurate, concerning the biology of certain specific bacteria under the headings of the diseases with which they are usually associated. The author states in

his preface that his aim has been "not so much to marshal facts as to point out principles and suggest problems," and we think he has been well advised not to lay stress on his "facts," of which the following may be taken as examples: "Preventive inoculation against typhoid with the *serum of immunised animals* has been largely practised by Wright." The italics are ours. "In the case of intra-peritoneal injections—i.e., of tuberculous material—there are no local manifestations." Nor have we been more successful in our search for "principles pointed out" and "problems suggested" unless such sentences as "it is impossible to say whether extracellular toxins are actually excreted or are produced by the bacteria acting on the chemistry of the nutrient medium" and "the organisms which simulate pathogenic forms are usually called pseudo bacteria" come under one or other of these headings. Two appendices, A and B, deal with the principles of bacteriological technique and snake venom respectively. The illustrations are for the most part selected from those which have already appeared in Curtis's "Essentials of Practical Bacteriology," whilst others have been taken from other publications issued by the same publishers.

Applied Surgical Anatomy Regionally Presented for the Use of Students and Practitioners of Medicine. By GEORGE WOOLSEY, A.B., M.D., Professor of Anatomy and Clinical Surgery in the Cornell University Medical College, Surgeon to Bellevue Hospital, New York, &c. With 125 Illustrations, mostly coloured. London: Henry Kimpton. 1903. Pp. 521. Price 21*s.* net.—To the average student surgical applied anatomy is of far more interest than the anatomy which he learns in the dissecting room. The latter may appear of little value, while the object and value of the former are obvious at every step. In recent years the number of text books of surgical anatomy has largely increased and the work before us is worthy of taking its place among the best which have hitherto appeared. The author recognises the limit of his subject and does not obtrude upon it details which belong to pure anatomy. The numerous coloured illustrations are of great value and they are sufficiently diagrammatic to be readily understood. They have for the most part been borrowed from standard text-books on anatomy. We can confidently recommend the work to students as a valuable guide to surgical anatomy.

New Inventions.

BABY EXERCISER AND DEVELOPER.

I HAVE lately been using in my practice an ingenious contrivance for quite young babies of, say, from four to 12 months old, by which they appear to develop and to thrive very rapidly. It has no dangers or drawbacks of any kind and should be appreciated by nurses and mothers, particularly in the case of backward or delicate children of poor muscular development or with weakly digestions. The "developer" can be suspended from the doorway or any other convenient place and it consists of a strong metal spiral spring from which the baby is suspended by a broad strong band which passes round the body from below the armpits with a T-shaped piece going under the perineum. From the upper sides of this band straps run to the outer ends of the crosspiece which is attached to the spiral spring. The baby is now securely slung with the toes just touching the floor and after a few short lessons learns to swing gently up and down, helping himself by the very slight purchase that he gets from the ground. Detached from the crosspiece it can be used to teach the baby to walk. I generally recommend a few minutes once or twice a day to start with, to be gradually increased later. The entire combination can be adjusted to the top part of a door. A child from six months to a year old may be adjusted so that the toes are from three to six

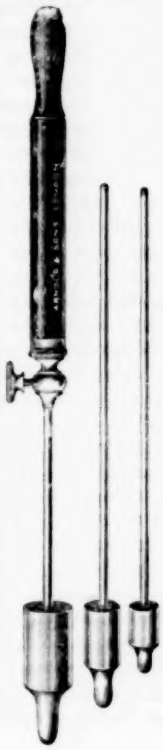
Front view from life showing a baby securely suspended, having perfect use of arms and legs, with toes barely touching the floor. Supporting less than one pound of his own weight.

inches from the floor. In putting on the girdle too much clothing must be avoided underneath. It can be put on nicely with dress, flannel skirt, and diaper.

The apparatus can be obtained from Messrs. William Parton and Co., 94, Queen-street, London, E.C., price 11*s.* 6*d.*

J. LYNES, M.R.C.S.Eng., L.S.A.
Argyll-road, W.

THE POCKET "RESERVOIR" CAUTERY.



THIS cautery is called "Reservoir" because on heating its body acquires sufficient heat to feed its point for a considerable time during use. It is very handy. It cannot get out of order and it requires no apparatus outside itself except some heating source—a gas jet or a spirit lamp, for example. Its adjustment is so easy that it can be used like a pen. Its uses are many, but it is specially designed to destroy nævi with one application. In using the cautery, the operator extends the rod through its handle to the full length, tightens the screw, and makes the cautery red hot; he then loosens the screw, drops the cautery back through its handle to the desired length, re-tightens the screw, and uses the cautery. After use it is dropped into water. It is made by Messrs. Arnold and Sons, West Smithfield, London.

J. F. RUSSELL, L.R.C.S. Irel.
Greenwich.

THE LANCET.

LONDON: SATURDAY, OCTOBER 3, 1903.

The Teaching of Medicine in London.

ON the occasion of the reopening of the medical schools it is natural to turn our thoughts towards the present state of medical education. Certainly so far as London is concerned there is great and grave cause for reflection as to the future of the medical schools. The increasing prosperity of some of the provincial medical centres as well as the multiplication of provincial universities have been the means of lessening the number of students commencing their professional studies in the metropolis, and this steady, if as yet only gradual, decrease in the entries at many of the London schools exercises a considerable influence over the position of the teachers. There are many causes for the desire to receive medical education elsewhere than in London, but this one cause is always added to others that may be present—a degree can be obtained more easily elsewhere than at the University of London. The handicap to which a medical man is subjected by not being able to style himself "doctor," when he has possessed himself of the diplomas of the various conjoint boards or corporations, has long been felt and the grievance—a very real one—has been freely ventilated in our columns. Undoubtedly the disabilities under which the holders of diplomas sometimes find themselves have caused many medical students to choose as their educational centre places where a curriculum of adequate standard is rewarded by a medical degree. London never has been such a place and at present it does not promise any immediate change for the better. It is a singular fact that for many years the largest city in the world did not possess a teaching university. Although London has been a centre of civilisation for over one thousand years, its first attempt at the possession of a university was the institution of an examining body less than 70 years ago. This examining body has now been replaced by a teaching university on a most elaborate model, to which are affiliated schools and institutions dealing with most provinces of exact or theoretical knowledge. Such an institution requires, to speak colloquially, time to shake down, and for the present it does not seem that the London student is within a measurable distance of obtaining a medical degree in return for work which would secure him successful graduation in other places. Therefore he is going in larger numbers each year to the other places, although as a clinical centre for instruction London is unrivalled throughout the world. This is unfortunate for him while it makes a great difference to the position of the teachers attached to the metropolitan hospitals. Their classes have dwindled and their fees are absorbed by the enhanced expenses attaching to the modern medical school. Under the new charter of the University of London lecturers and teachers in considerable number have been appointed, as all the medical schools have been made a part of the University, and the question again arises as to how far the tuition of the London medical schools should be centralised. This is a large subject and one that has for many years pressed for attention, though not with the urgency that it now does. Its complexities can only be alluded to, but all interested in the medical education of the London student—and this should imply all members of the medical profession—ought to make themselves familiar with the situation, as some sort of economy of labour on the part of the medical teachers of the metropolis will soon be necessary.

In order to meet all the requirements of modern medical education large sums of money have been spent on the erection of physiological, bacteriological, and pathological laboratories, and the resources of some of the schools have been materially crippled by these valiant endeavours to meet the requirements of modern research; so much so that the fees to the lecturers have been grievously lessened or have altogether been absorbed in the general expenses of the medical school. At the same time the number of lectures which students are required to attend has been greatly increased in consequence of the extended scope of the medical curriculum, so that the deans of the medical schools find considerable difficulty in apportioning the hours of the day in such manner as to insure that the students shall receive the necessary instruction, while leaving a little leisure for the lecturers, the majority of whom are in active practice as physicians or surgeons. The actual benefit of such a multiplicity of lectures has been much questioned. It has been maintained by some, and by persons who are practically qualified to speak on the subject, that students can obtain more sound information by reading and attendance on practical work than by listening to discourses of which they are able to assimilate only a small portion. Too much importance must not, in our opinion, be attached to this view while the fact that students are not all alike must be remembered. No doubt in certain subjects practical demonstrations are of far more value than theoretical lectures. Yet a course of lectures on systematic medicine, including under the term surgery, is undoubtedly necessary to most medical students if they are to pass their examinations at the times which the curriculum appoints and without the help of private tuition. The student requires a guide; neither manuals nor the examination of patients will suffice to inform him as to the relative value of the many theories and opinions which he will read of and will hear discussed. It is not so much that he does not know what to lay hold of and what to reject, as that he does not know among the things which form the accepted scheme of medicine which is important and which is trivial. The systematic lecture on medicine should relegate all theories to their proper place. Lectures, however, which play this important part in the student's education require prolonged consideration and careful revision, and as a matter of fact they need more time for their preparation than the busy physician or surgeon can conveniently devote to them. On the other hand, practical as distinct from systematic medicine—again of course, including surgery—cannot be imparted in the lecture-room. It is useless to try

to teach the methods of palpation, or the lessons to be learnt from percussion and auscultation, without accompaniment by a demonstration upon a living subject. The wards and the departments for out-patients are the only places in which satisfactory instruction in practical medicine can be carried out, and a long course of lectures on the subject without practical demonstration is a waste of the lecturer's time, and for the most part a waste of the student's time. Some students require much more help than others, and there may be here and there a few who find it useful to have their practical instruction imparted to them in the form of abstract rules which they can lay to heart and can apply at their leisure upon the body, but such students do not form the majority.

Lectures, then, are being given in the metropolis at a dozen or more different centres on the same subjects, while the value of many of these discourses is open to doubt. Also they are being given without much reward by men who could find more useful employment, from their point of view, for their time. With these considerations before us it becomes a matter for contemplation whether it would not be better to centralise some of the teaching of the metropolitan medical schools. At the hospitals which provide unequalled clinical material lectures on practical medicine might still be delivered, because such lectures ought to bear relation to the cases in the medical or surgical wards as often as possible; but the time seems to us to be ripe for the discussion of the advisability of teaching the ancillary subjects at a central school, leaving the medical staffs of the hospitals to devote their time to the teaching of practical work in the wards and the delivery of lectures based upon the cases then within the buildings. We believe that more benefit to the students would accrue by this method than by the plan now adopted of arranging for lectures on all the subjects of the medical curriculum at each hospital. We are aware that this centralisation of teaching would revolutionise the existing arrangements at the various hospitals, while it is clear that at certain of these institutions the position of the lecturers is a much better one, pecuniarily speaking, than it is at others. Some such economy of labour, however, we think would be for the ultimate good of medical education. Difficulties naturally there would be in carrying out the proposal, but when the difficulties were overcome the benefit would be great for the London student. By simplifying his educational course he would be enormously helped towards the attainment in London of the medical degree which he is beginning to look for elsewhere. The funds of the different schools would probably benefit by the opportunities thus offered for post-graduate teaching, as arrangements could be made suitable for qualified men wishing to obtain a more extended experience in clinical work. Should the plan be found to answer in two or three of the smaller schools, where it could first be given a trial, the larger hospitals, where at present there is not the same need for an alteration of methods, would probably follow suit. We think that some form of centralisation of teaching would now benefit both teacher and taught, and we believe that the simplicity in the educational course that would ensue might help more London students to obtain the medical degree of the University of London.

The Relations between the Pelvis and the Fœtus.

ONE of the most interesting problems in connexion with the physiology of the unborn fœtus is the question of the factors concerned in its growth. When we consider, as BALLANTYNE points out, the complexity of fœtal nutrition it is not surprising that our knowledge of the subject is of the scantiest description. It is a matter of everyday observation that in different pregnancies children of the same mother born at full term may vary markedly in size. How are we to explain these marked differences in development? Many writers have attempted to do so with a varying amount of success. In 1879 LA TORRE considered the whole question of the development of the fœtus very fully and discussed the different factors concerned. One very important point was brought out by his investigations and by those of BUDIN, PINARD, and others—viz., that the fœtus acquired the same development and size in contracted pelves as in normal pelves. The size of the pelvis then in cases of pelvic contraction bears no relationship at all to the size of the fœtus born through it. Further researches have only tended to confirm these observations. The factors concerned in the growth and development of the fœtus are undoubtedly very numerous and no single one can in the present state of our knowledge be said to be of paramount importance.

In an article published in THE LANCET of Sept. 26th, p. 885, Captain C. A. LANE, I.M.S., brings forward a new theory on this subject. He has carried out a clinical comparison of the maternal pelvis and of the fœtus in a number of Europeans, Eurasians, and Bengalis; and as a result of his investigations he enunciates the following law by which the size of the child at birth is to be determined. "The child grows in utero in such a manner and at such a rate that at full term his size is proportional to that of the mother's pelvis through which he has to pass in order to be born." The size of the pelves was determined from the measurements of the intercristal and interspinous diameters and of the conjugate diameter, the latter being measured through the abdomen at a time after delivery when the uterus had involuted so far as to be below the level of the pelvic brim. From a consideration of these measurements Captain LANE comes to several very important conclusions. He confirms the fact long known that the length of the interspinous and the intercristal diameters bears no definite relation to the length of the conjugate diameter. He shows, however, that the length of the interspinous diameter, if the intercristal diameter be taken as 100, bears a percentage relationship to the length of the conjugate diameter, so that as the conjugate diameter increases this percentage becomes less. The further fact is demonstrated that the result of the admixture of the native race with the European is to diminish the measurements of the pelvis of the latter in all its diameters, while, on the other hand, the measurements of the heads of the children show a definite increase in size with the greater admixture of European blood. By far the most remarkable conclusion, however, come to by Captain LANE is that the weight and size of the child's body and the size of the head (all cases of pelves with a conjugate measuring less than 3·75 inches being excluded) bear a

definite relationship to the size of the conjugate diameter of the pelvis through which the child has to pass. His tables tend to show that every step in increase in the size of the conjugate diameter of the pelvis is accompanied by an increase in the average size of the child, with the exception of children born through pelves with a conjugate diameter of 3·5 inches or less. As we have already pointed out, it has been conclusively shown by BUDIN, LA TORRE, and others that the size and development of children born of mothers with contracted pelves are normal. They are as well developed at the different periods of pregnancy as the children of mothers with a normal pelvis. To overcome this objection, which Captain LANE recognises, he excludes from consideration all pelves with a conjugate diameter of less than 3·75 inches. He holds that such pelves cannot be considered as produced by normal laws of growth, they are not due to a hereditary condition capable of being transmitted to the child, but to an acquired peculiarity not capable of being so transmitted; these apparent exceptions need not, therefore, be held to invalidate the general law. While we must admit that most of the cases of contracted pelvis that are met with are due to conditions acting after birth, yet this is by no means always the case; there are many recorded instances of patients with contracted pelves in which the size of the child bore not the least relationship to the size of the pelvis, and in which the deformity of the pelvis was of a congenital character. If the new law enunciated by Captain LANE is to hold good it would require that all the children of any mother should be of approximately the same size, and yet we know that this is very far from being the case. He does not appear to consider this objection at all and his cases do not seem to include any instances of two children born of the same mother.

Captain LANE'S observations are of much value and represent a line of investigation in which but little work has yet been done—viz., the relationship of the size of the child to that of the pelvis through which he has been born. The number of cases that he records is much too small, however, to allow of any such sweeping statement being made as that which he has deduced, nor do we consider that the methods adopted are sufficiently accurate. To prove such a contention we think that a series of measurements of the pelvis carried out either on the cadaver or on the living subject under anæsthesia would be necessary, since differences of so small a measurement as a quarter of an inch are in question. That a general relationship exists between the size of the pelvis as a whole and the size of the child's head is, of course, well known and is illustrated by the measurements of the heads and pelves of the lower races, but the researches of BUDIN and RIBEMONT have shown that the size of the head of the child and the length of the child's body, although they tend to increase with an increase in the weight of the child, yet by no means do so in a proportionate manner. The problem is a fascinating one and we could wish that its solution was so simple as Captain LANE would have us believe, but we are afraid that it is not. If the explanation of the varying size of newly-born children is so simple as this then we must eliminate the paternal factor altogether, an influence which, according to LA TORRE, is of much importance. Whatever may be the case in man, no one can doubt the influence of the male parent upon the size of the offspring in the case of animals. The obscurity of the whole matter is still further illustrated when we consider that the size to be attained by the fœtus is probably determined before the second month of its existence. No doubt heredity plays an important part, but whether the part is that assigned to it by Captain LANE is a matter for the future to decide. The figures quoted are undoubtedly most striking and certainly call for further investigation, but we question whether they will be found to hold good when larger series of cases are taken into consideration.

The Disappearance of Miss Hickman.

THE disappearance of Miss HICKMAN still remains unexplained. At midday on August 15th she left the Royal Free Hospital, where she was at the time holding a temporary employment, and from that hour nothing whatever has been heard of her. Many so-called clues have presented themselves and upon being followed up have been discovered to lead to nothing. Many suggestions for the solution of the mystery have been proffered, but they have all failed to locate her whereabouts; none of them has led to her discovery alive or dead. In common with the rest of the press we have received from her distressed father, Mr. E. F. HICKMAN, a letter in which he says: "It is incomprehensible that a young woman doctor in the very best health, both mental and physical, of evenness of temper and strength of character, united to all her family and friends by close ties of kindred and affection, devoted to her work as a physician, fond of helping the poor, and completely happy and useful in every respect, should suddenly disappear at noon from the hospital in the centre of London." Further, Mr. HICKMAN considers that it will be a great disgrace to this country should his daughter not be recovered and should the matter "be hushed up. If so, no woman will be able to feel safe in future in London streets in broad daylight." The meaning of Mr. HICKMAN'S letter is clear. He does not recognise the possibility of anything having happened to his daughter save foul play. A communication has been received by him from the Royal Free Hospital stating that the members of the medical staff of the hospital see no reason to believe that the missing lady was not in her normal state when she left the hospital, and this opinion is used by Mr. HICKMAN as proof positive that his daughter must have been induced to go to some house of ill-fame where she may be still detained, and he would urge on the public, if only for selfish reasons, to spare no pains in the elucidation of her fate.

We do not consider that the communication from the medical staff of the Royal Free Hospital ought to weigh so heavily with Mr. HICKMAN and for our part we are not disposed to draw any distinct inferences from it. Individual members of the medical staff are not likely to have, all of them, been in direct personal communication with Miss HICKMAN immediately before her disappearance and those who happened to find themselves in contact with her might not have been observing her demeanour in the least closely. And surely there is no proof

that an attack of mental oblivion need necessarily be preluded by any lengthy or noticeable psychical disturbance. But while we cannot indorse Mr. HICKMAN'S view that it is impossible that some mental affliction should have overtaken our unfortunate professional sister we are equally unable to indorse the view, attributed by him to the London police, that it is impossible that a woman should be detained against her will in some house of ill-repute. We know that we have a good police and that, on the whole, they are an intelligent as well as a wonderfully brave and self-sacrificing body of men; but considering the population and vast extent of greater London in connexion with the numbers of the police we cannot regard it as an impossibility that one woman should be lost. 7,000,000 of persons dwelling in 700 square miles of houses are protected by 17,000 policemen all told, the City of London police being included in these figures. We do not think, bearing these rough figures in mind, that anyone can assert that the illegal detention of a woman cannot take place, while the possibility of total disappearance is sufficiently demonstrated by the fact that such an occurrence has often happened before. In London many disappearances have been chronicled that have never been accounted for. It is not so many years ago since a young woman, a considerable heiress, left her house near Knightsbridge at noon to walk in Hyde Park. She was seen to enter Hyde Park and she has never been seen since. The story is one the details of which happen to be known to us personally, but we understand that its counterpart could be quoted to us by many solicitors. While for our part we consider that the explanation of Miss HICKMAN'S disappearance may still depend upon some phase of mental aberration in which she has wandered abroad, we do not think that the notion of forcible imprisonment should be pooh-poohed. On the face of it this terrible fate is not one that would be likely to befall Miss HICKMAN. We have her father's tribute to her character and every word of his is borne out by Miss HICKMAN'S friends. This was not a frail adolescent, but a strong woman in the fulness of her vigour, whose medical education had brought her into conflict with things as they are. She perforce knew life in a way that the mere girl would not know it and the ordinary snares would have had no chance of entrapping her. If she is immured somewhere against her wish considerable force as well as fraud must have been employed against her.

Mr. HICKMAN in his letter asks for the coöperation of judges, bishops, Members of Parliament, members of the medical profession, clergymen of all denominations, and other influential men and women to make "a powerful appeal to the Home Minister for a public inquiry," and in so far as our coöperation as a medical journal is likely to be of service we are happy to accord it. But it must be pointed out that, after all, the Home Secretary is officially the head of the police and we know the police of London far too well to suppose that any apathy exists in the force with regard to the case of Miss HICKMAN. The powerful appeal to the Home Secretary can only result, so far as we can see, in further stimulation of the police, and there is no evidence that this is called for. Put upon the lowest grounds, the constable or detective who should recover Miss HICKMAN, or should find the clue to her fate, would receive a large sum of money as a reward, an amount of public notoriety that he would be more than human not to covet, and promotion at an early date. We do not consider that any practical purpose will be served by urging more effort upon the Home Secretary but we think that a fund might well be opened to increase the reward for the discoverer of Miss HICKMAN, in the hope that if she is immured in some horrible abode of vice or crime somebody may reveal the plot. For it must be remembered that she cannot have been kidnapped, and cannot now be kept in durance, by one man only. Such a crime implies accomplices and where there are accomplices there is always a chance of an informer. If Mr. HICKMAN is advised by those in legal conduct of the search for his daughter that an increased reward would assist their efforts we will endeavour to help to the best of our ability by opening a subscription in this journal to which medical men may contribute. Our deepest sympathy goes out to Mr. HICKMAN and his family in their terrible distress.

Annotations.

"Ne quid nimis."

COLONIAL APPOINTMENTS ON THE WEST COAST OF AFRICA.

IN THE LANCET of August 22nd, p. 580, a correspondent asked for information with regard to colonial appointments on the west coast of Africa. He wished in particular to know whether the climate is as unfavourable as it is said to be and whether the rate of living is expensive. In our next issue "Colonial" in reply gave a very dark picture of the unhealthiness of the climate and stated that "living in the large towns is perhaps the most expensive in the world." He finally closed his letter by saying: "It is obvious that the terms offered by the Colonial Government are totally inadequate to the danger and cost of living." We knew that "Colonial's" description of the conditions under which these appointments were held was not a wholly fair or accurate one and warned our readers to that effect. In our Students' Number (Sept. 5th) a correspondent, writing above the signature of "M.B.," confirmed our view by drawing a far less gloomy picture of the climate than "Colonial" had done, while traversing some of "Colonial's" definite statements. "M.B.," however, did not deny that the climate is bad, stating, in fact, that the west coast of Africa is one of the most unhealthy parts of the world. He also said that the pay offered to colonial surgeons is wholly inadequate. "The actual conditions of service," his words run, "are not what they appear to be in England," and he practically accuses the Colonial Government of not keeping faith with their employés. To this letter we published a reply in our issue of last week, p. 925, from the Colonial Office, in which it is stated that most of "M.B.'s" remarks "appear to relate to a period some four years ago and since then ..... the rates of salary and other conditions of service in the West African medical staff have been substantially revised and improved." We may take it as a matter of fact that the climate of the West African colonies and protectorates is far from being a healthy one and that the Colonial Office does not expect medical men to take service in that part of the world unless the inducements offered are to some extent sufficient to balance the risks to health. According to a pamphlet issued by the Colonial Office, dated August 18th, 1903, giving information for the use of candidates for appointments in

the West African medical staff, the minimum salary of a medical officer is £400, rising by an annual increment of £20 to a maximum of £500. The minimum salary of a senior medical officer is £600, of a deputy principal medical officer £700, and of a principal medical officer £1000, except in Sierra Leone and Lagos where it is £800. If the medical officer, while in the service of the Government, must keep a horse or hammock an allowance of 2*s.* 6*d.* a day is made. A reasonable amount of stores is carried free of cost and travelling out-of-pocket expenses are paid. Every medical officer before departure is allowed £12 for a camp outfit and special allowances are made where employment is required in the field or bush and on military expeditions. "The ordinary tour of residential service is one year, followed by leave with full pay during the voyages to and from England and for four months or two months clear in England, according as the officer is returning for further service in West Africa or not." Pensions are granted after 18 years' service calculated at one-fortieth of the last annual salary for each year of service. This is necessarily a very brief summary of the conditions under which appointments are held. They are certainly not ideal ones but they may be acceptable to some medical men whose health will stand the strain of the work and the climate, always provided, however, that the conditions laid down are not encumbered by red tape.

FACTS ABOUT RADIUM: ITS OCCURRENCE AND ISOLATION.

ALTHOUGH a good deal has been said about the remarkable heat- as well as light-giving properties of radium, and it is possible that these properties may be of considerable utility in medical science, there are some facts concerning its occurrence in, and separation from, its native habitat which are not generally known. It may be well, therefore, to point out that it was the better—but still rarely—known metal uranium which first gave rise to the suspicion of the existence of a radio-active property in elements; and in the methods adopted for the separation of pure uranium salts from their native source solutions were obtained which showed an intenser degree of radio-activity than did the pure uranic salts themselves. The suggestion soon followed that there were elements present in the uranium ores which were more radio-active than uranium and subsequent research proved this to be the case. The native ore of uranium known as "pitchblende" was found to contain radium, an infinitely more radio-active element than uranium. "Pitchblende" is found in Cornwall, in Adrianople, in Bohemia, and in other localities. The mineral contains about 75 per cent. of the oxides of uranium, the residue consisting of sulphide of lead, silica, lime, magnesia, iron, barium, manganese, and soda, and a small quantity of radium. Uranium is a malleable and hard metal with a colour like that of nickel. It readily discolours on exposure to air, is very nearly as heavy as gold, and is about one and a half times heavier than lead. The salts of uranium have long been known to be radio-active, but those of radium are probably 60 times more so. The process by which radium is extracted from pitchblende and separated from the uranium in it is very long and tedious while the yield is very small. Operations for extraction are commenced by crushing the pitchblende which, to start with, is by its comparative rarity an expensive ore, and then roasting the powder with carbonate of soda. After washing, the residue is treated with dilute sulphuric acid; then the sulphates are converted into carbonates by boiling with strong solution of carbonate of soda. The residue contains radium sulphate which is an exceedingly insoluble salt. The soluble sulphates are washed out and the residue or insoluble portion is easily acted upon by hydrochloric acid which takes out amongst other things polonium and actinium. Radium sulphate remains unattacked associated with some barium sulphate. The sulphates are then converted into carbonates by treatment with a boiling strong solution of carbonate of soda. The carbonates of barium and radium are next dissolved in hydrochloric acid and precipitated again as sulphates by means of sulphuric acid. The sulphates are further purified and ultimately converted into chlorides until about 15 pounds of barium and radium chloride are obtained by acting on one ton of crushed pitchblende. Only a small fraction of this mixed chloride is pure radium chloride which is finally separated from the barium chloride by crystallisation, the crystals from the most radio-active portion of the solutions being selected. In this way the crystals ultimately obtained are pure radium chloride of a very high degree of radio activity. It occurred to the discoverers of radium—M. and Madame Curie—to determine whether commercial barium chloride contains radium, but the chloride obtained by the process of fractionation showed no radio-activity and contained, therefore, no radium. The salts of radium closely resemble the salts of barium and are white but gradually become coloured; they are luminous in the dark and, besides, spontaneously and continuously evolve heat. The nature of this mysterious element and its puzzling behaviour are still the subject of all sorts of speculation amongst men of science, and it is curious to observe how ready some men have been to offer explanations which hitherto would have ranked as heresies in science.

THE NATIONAL SUNDAY LEAGUE.

THE National Sunday League has issued a pamphlet containing a brief history of the league and explaining its aims, objects, and work, and also a portrait of Mr. R. M. Morrell, one of the vice-presidents and the founder of the league, the eightieth anniversary of whose birthday was celebrated on Sept. 26th. Mr. Morrell began his campaign on his thirtieth birthday, August 31st, 1853, but the league itself was formally started on Sept. 7th, 1855. The objects of the league are stated as "the opening of museums, art galleries, and libraries on Sunday afternoons, maintaining the 'Sunday evenings for the people,' Sunday excursions, Sunday bands in the parks, and generally to promote intellectual and elevating recreation on that day." Mr. Morrell's first letter opening the campaign appeared in *Lloyd's Newspaper*. A committee was formed of which Sir Joshua Walmsley, M.P. for Leicester, became the president and Mr. Morrell became honorary secretary, which office he held till 1880 when domestic affliction obliged him to retire. The Manchester corporation was the first municipal body to open its free library, while Birmingham was the first (1872) to throw open its art gallery for Sunday inspection. Owing to the strenuous opposition of the Lord's Day Society it was not until 1885 that Lord Thurlow's motion in the House of Lords in favour of opening the national collections on Sundays was carried, and then only by a majority of eight, and it was not until 1896 that a similar motion by the Hon. W. F. B. Massey-Mainwaring, M.P., was carried in the House of Commons, the majority being 85. A few months later the South Kensington Museum and other national collections were opened and were visited, between May and November, by no less than 220,000 persons. The corporation of the City of London was only induced by Alderman (now Sir) W. P. Treloar to pass a motion in favour of opening the art gallery at the Guildhall on alternate Sundays on April 12th, 1894. During the winter and spring seasons from September, 1902, to May, 1903, 381 musical entertainments were given in 14 halls in London on Sunday evenings and were attended by 484,896 persons. 350,000 persons took advantage of the summer excursions during 1903 (nearly 10,000 every Sunday). 138 band performances were given in the various parks and

15 concerts were given to the inmates of London workhouses and were attended by 20,000 poor people. From April, 1902, to April, 1903, £1059 2*s.* 8*d.* were raised for various hospitals and other charities, being the proceeds of the Sunday evening entertainments for the people. We congratulate Mr. Morrell on the attainment of the eightieth anniversary of his birthday and also on the perseverance which he displayed in the prosecution of his scheme to promote intellectual recreation on Sundays. The Church has never taught that Sunday should be a day of gloom but, on the other hand, it was never intended to be a day of pure amusement. In any case it is, we fear, certain that there will always be a very large number of persons who do not attend any place of worship and in the case of such persons it is surely far better that they should have the opportunity of looking at beautiful things or of hearing good music than, having no such opportunity, that they should waste their time in gambling or in drinking. In a book recently published, called "Memoirs of a Social Atom," a vivid contrast is drawn between the opportunities for instruction and amusement enjoyed by all classes now as compared with 50 years ago. For this relief much gratitude is due to the National Sunday League. As regards the Sunday excursions we are doubtful both of their hygienic advantages and of their recreative abilities, while there is no doubt that they cause a large increase of work to railway men and others.

LONDON MACADAMISED ROADS.

WE do not know whether the Royal Commission upon London traffic is going to consider the question of roads but it seems to us that the system upon which London macadamised roads are made is quite wrong. There are not many of these roads, but those which do exist are, in our opinion, put down upon quite wrong principles. The surface of these roads never lasts in perfection for more than a week and then the roadway wears into holes. The result is increased friction for traffic and a series of puddles which in wet weather are full of dirty water or rather a solution of manure. Macadam laid it down that the stones to be used in making his road surfaces should never exceed six ounces in weight—that is to say, that they should be less than that weight, and moreover they should be able to pass through a ring with a diameter of two and a half inches. His rule in practice, we believe, was that the stone should be no larger than could be put in the mouth. A road made with stones of this size binds well and lasts for some time. Everybody who uses a cycle or a motor-car knows the excellent surface of the Great North-road, especially in the Hatfield section thereof. We recently picked a stone at random from a heap in readiness for mending this road and found it to weigh one and a half ounces, the shape, moreover, being roughly cubical. As a specimen of a London road we took Exhibition-road which is constantly being repaired and as constantly rough and full of holes. A stone picked at random from this road was five-sided and roughly triangular. Its weight was eight and a half ounces and it required a ring of just over three inches in diameter to pass through. The road is made in the following way. After being "scarified" by a machine lumps of granite of the average size just mentioned are put down. Then a steam-roller is run over the roadway. Next a layer of coarse sand is put down and then the steam-roller goes over the road again. The result is a road which wears into pockets within a week of the traffic commencing. Such a road is expensive to the ratepayers and unhealthy—expensive because it constantly has to be relaid and unhealthy because it wears into dust and into pockets which are mere traps for horse dung. If the authorities were to insist upon the road metal being broken into pieces of about half the size of those now employed a saving would be effected, for the roadway would last much longer than at present and so the expense of relaying would be saved, the surface would remain even and so be more readily cleansed, and by reason of more easy traction owners of horses and carriages would be spared unnecessary wear and tear of their stock. It should be obvious to anyone that a large stone, such as the one from Exhibition-road to which we have referred, can never bind, for by its size and shape it acts as a lever whenever a wheel passes over it, one end rising up as the other is pressed down. There is a constant cry for work among the labouring classes in London. Let the municipal authorities offer stone-breaking work and see that the road metal is broken small in accordance with Macadam's practice. A stone of one and a half ounces is perhaps rather small, but if London roads were metalled with stones weighing between three and four ounces a great improvement would soon be observed.

GIGANTISM, WITH AN ACCOUNT OF THE POST-MORTEM EXAMINATION OF THE AMERICAN GIANT, WILKINS.

AN interesting account of the abnormal state of growth known as gigantism, together with the records of the post-mortem examination of a giant who died at the Presbyterian Hospital at Chicago, is published by Dr. P. Bassoe of the Rush Medical College, Chicago, in the *Journal of Nervous and Mental Disease* for September. The subject of these observations was Lewis Wilkins, a native of Minnesota, aged 29 years. In 1893 he was examined by Professor Charles Dana who described him as a case of "acromegaly and gigantism with unilateral facial hypertrophy." His parents were healthy people of average height and he had six brothers and sisters all of ordinary height. The boy grew steadily and rapidly till, at the age of 17 years, he was over seven feet high. At the time of his death his height was eight feet two inches. He had been on exhibition during the past 12 years and had travelled extensively in the United States of America and Europe. The left side of his face showed a remarkable osseous hypertrophy involving the frontal bone and the upper and lower jaws. The hypertrophy corresponded closely with the distribution of the left trigeminal nerve. The upper alveolar process and the palate were also hypertrophied. About two years ago the patient was seen by Professor Virchow of Berlin who, it is stated, pronounced the osseous growth to be a benign one and said that it was on the external surface of the skull and would probably never cause him trouble. On admission to hospital on June 28th, 1902, he was found to be suffering from attacks of vomiting, tinnitus aurium, and diarrhœa. While in the hospital he was dull, almost semi-stuporous. The pupils reacted neither to light nor to accommodation and the left eyeball was immobile. There was an area of anæsthesia on the left cheek and on the left side of the tongue. He gradually grew worse and died in hospital on July 10th, 1902. The necropsy revealed the following conditions. The cause of death was ulcerative ileo-colitis and chronic catarrhal gastritis. The lungs showed evidences of hæmorrhagic bronchopneumonia. There was diffuse hyperostosis of the frontal, left parietal, left temporal, and left superior maxillary bones. The region of the pituitary body was occupied by a sarcomatous mass. The thyroid gland weighed 112 grammes; it was uniformly enlarged and its follicles appeared to be distended with an unusual amount of colloid material. The heart and the lungs were normal. The frontal region of the skull was much thickened on the left side, the thickness in

the median line being three and two-fifth inches. The base of the skull was greatly deformed. The left anterior and middle fossæ were almost entirely obliterated by the ingrowth of bone. The pituitary fossa was wide and its floor was partly eroded. Its cavity was occupied by a tumour, portions of which had grown into the orbits, the ethmoidal sinuses, and the naso-pharynx. This tumour was in its upper median aspect incorporated with the infundibulum. A gelatinous fluid exuded from the cut surface of the tumour. It had to be scooped out in pieces which, together with the part adherent to the infundibulum, weighed somewhat over 300 grammes. The brain (hemispheres and cerebellum) weighed 1540 grammes. The tumour was examined and found to be a sarcoma of the spindle-cell type showing numerous karyokinetic figures. Here and there small necrotic areas were scattered within it. "The tumour may be designated," says Dr. Bassoe, "an osteoplastic sarcoma, with œdema and mucoid degeneration." The hypophysis cerebri was pressed upon and inclosed by the mass of the tumour and its substance was beset with numerous small hæmorrhages. The alveoli of the thyroid body were generally distended with colloid material and in places several alveoli appeared to have coalesced. Chemical analysis of the gland showed that the proportion of iodine in it was normal, but as the gland was of about six times the size of a normal thyroid the quantity of iodine was correspondingly large. Dr. Bassoe regards this enlargement of the thyroid gland as a process of "compensatory hypertrophy" occurring in association with the disease of the pituitary body. Many cases of gigantism show some relation to acromegaly and are associated with an abnormal condition of the pituitary body. "That this giant, particularly with a diseased hypophysis, should have a large amount of iodine in his thyroid was to be suspected," adds Dr. Bassoe, "and agrees with theory." The interest of the case lies in the fact that a profound nutritive disturbance affecting particularly the growth of the osseous system and leading to gigantism was found in connexion with an abnormal condition of the pituitary body, an organ the functions of which in man still await elucidation.

THE BATTLE OF THE CLUBS AT SHIPLEY.

OUR readers are advised to give careful consideration to a story from a well-informed correspondent which will be found under the familiar heading of "The Battle of the Clubs" on p. 932 of this issue of THE LANCET. Once again the attempt on the part of the medical profession to meet a medical aid association half way, and so to minister to the wants of the community upon club terms, has met with ill success. No one can say that the medical men have not been conciliatory in the course of the disputes that have arisen between them and the local Oddfellows' clubs. To begin with, the wage-limit was waived and, whatever the weekly income of the Oddfellow might be, he was allowed to have his medical attendance at contract prices. Then the right of a medical man to decline attendance on a patient was partially surrendered lest hardship should unwittingly be inflicted by the exercise of a very proper discrimination. But still the Oddfellows wanted more. They wanted to establish female clubs and to make it compulsory upon the medical officers to attend anyone who was sent to them. The medical officers have refused, and rightly refused, to accept the propositions made to them and their services will terminate at the end of this year. Our correspondent says that the medical aid association intends to import one or two medical men to fill the vacancies, giving them at the same time permission to take private patients. Our readers want no hint from us that to accept these appointments upon the terms that the resigning medical officers have refused will be a professionally discreditable act. The resigning medical officers have only stood out for their professional rights, and if the case were put properly before the members of the medical aid association this would probably become perfectly clear to them. But this, we may be certain, will not be done. An attempt will be made to import medical men into Shipley and the attempt will be unsuccessful, as no medical man of any nice sense of conduct will accede to the proposals of the Oddfellows and take up his residence in a place where not one of his professional colleagues will recognise him.

THE PRICE OF A BATH AT HOTELS.

IT is an undoubted hardship that those who are compelled to spend some of their time at hotels and who are particular as to the cleanliness of their persons should have to pay such exorbitant sums as are commonly charged for the daily bath. Clearly hotel proprietors, go-ahead though they may be in many ways, still regard a bath as a luxury instead of a perfectly normal item of the toilet each morning. The cold bath is not enjoyed by everybody and so the charge for it is the minimum one of a shilling. Immediately, however, it is requested that the chill shall be taken off then the tariff is that of a hot bath which is 2*s.* or even more. The cleanly disposed person thus has to put up with a charge of from 12*s.* to 14*s.* a week for a daily bath, a sum which might easily be a fifth part of his total weekly bill. This prohibitive price cannot surely be due to the cost of the water itself or to the cost of heating it. It is rather, we should say, part of that same spirit of unreasonableness which characterises hotels in regard to the charges for wines. The average price charged for a bottle of ordinary red wine, probably worth less than 1*s.* 6*d.*, is 4*s.* and it is not often that the visitor is able to speak in terms of unqualified praise of it at that price. We believe that one effect of this system of surcharging in the case of wine has been to encourage the drinking of spirits. It is, at any rate, a fact, as a glance round the dining tables at hotels will readily show, that most of the visitors ignore the wine list and drink weak whisky and water, plain or aerated, with their dinner. As to baths, however, the excessive charges made for them are of sanitary importance for the tendency of high prices in this connexion is obviously to lower the ordinary standard of personal cleanliness.

NECROSIS OF THE JAW IN TYPHOID FEVER.

THOUGH necrosis of bone is a well-known sequel of typhoid fever necrosis of the jaw is very rare. In the *Edinburgh Medical Journal* for September Dr. G. H. Edington has published the case of a boy, aged six years, who was taken to hospital on Feb. 16th, 1903, for a discharge of pus from the mouth. In March, 1902, he had typhoid fever. The attack was severe and there were several recrudescences. In the sixth week the buccal mucous membrane and gum near the left upper temporary molar teeth sloughed and a similar process seemed to be commencing on the opposite side. The affected surfaces were scraped and pure carbolic acid was applied. Ten days later the sloughing was checked but after another ten days necrosis of the upper jaw on the right side was noticed. A relapse of the typhoid fever occurred a week later. On August 6th a sequestrum with a tooth attached came away from the right upper jaw. On Sept. 6th the boy was discharged well. When he came under Dr. Edington's observation in February, 1903, he was healthy-looking. There was marked fœtor of the breath. The alveolar border of the left superior maxilla corresponding to the sockets of the temporary molars was bare and blackish. There was a loose sequestrum and the fangs of the first temporary molar were exposed and blackish. From under the retracted gum pus issued on pressure. The corresponding teeth and alveolar border of

the right maxilla were absent, the gap being covered by gum. Under chloroform the sequestrum was removed with forceps, the first temporary molar coming with it. The second molar was exposed by the removal of the sequestrum and as it was loose was removed with loose scales of bone. The blackened crown of the first bicuspid was found in the sequestrum. Keen in his well-known work on "The Surgical Complications and Sequels of Typhoid Fever" states that bone disease is in the vast majority of cases a sequel of typhoid fever. In his table of the various bones affected the superior maxilla was involved in five cases and the mandible in two. In the case related above the necrosis was a complication rather than a sequel.

THE OVER-ZEALOUS TEETOTALER.

ONCE again the cause of moderation has suffered by the zeal of the intemperate teetotaler. Our New York correspondent tells us that the efforts of the Women's Christian Temperance Union, which introduced into many of the public schools of the United States a system of instruction against the evils of alcoholism, have been frustrated by the sort of educational scheme which has been foisted upon the children. The teaching given to the rising generation of the United States upon the very important topic of alcoholism, though delivered under the head of "scientific temperance instruction," has been found by a committee of investigation not to be scientific temperate, or instructive. As a consequence little good has followed upon the organised and laudable endeavour to circulate the principles of sobriety among the young, for the lecturers have committed themselves to statements of absurdity patent enough effectually to destroy their pupils' confidence.

THE COLOUR CHANGES OF OXIDATION.

MANY colour changes are due merely to oxidation and degrees of colour are oftentimes a measure of the extent of this oxidation. The metal copper, for example, goes through a beautiful play of colours as oxidation proceeds until finally it is black. It may be pointed out, however, that the intermediate stages of colour, like the colours of a soap-bubble, are due to the mutual interference of the light reflected from the two surfaces of the thin film of oxide formed over the metal. Iron, again, in moist air will first present a blackish-green film and finally it becomes a bright-red as in the familiar rust. Zinc rust is white, mercury rust is red, silver rust is brownish-black, and all are simple examples of oxidation. As a rule the higher the degree of oxidation the more intense is the colour. The ordinary oxides of manganese and potassium are respectively light brown and white, when they are still further oxidised in company an intense green product is obtained, while a still further degree of oxidation produces a brilliant purple, as is seen in permanganate of potassium. The change produced in the colour of certain shell-fish by boiling is probably also the result of oxidation being promoted. The question is often asked, without a satisfactory answer being supplied, Why do lobsters and certain shrimps and prawns turn red on boiling? One reason it may be is that the black pigment of the lobster or the brown pigment of the prawn is an iron compound in the lower state of oxidation. On boiling, the black pigment turns to red perhaps because the iron in it has in the process of boiling been oxidised to the higher state, much in the same way as metallic iron turns to rust or a proto-salt of iron to a per-salt on boiling. It is easy to understand that continuous immersion in sea water would keep the black iron pigment permanent. On the other hand, the change in the iron compound may be one of hydration. Hydrated oxide of copper is, for example, green, while the dry oxide is black, and on simply boiling with water the hydrated green oxide of copper turns black. Red human hair is said to owe its brilliance to iron existing in the higher oxidised state and by means of reducing agents such as pyrogallic acid or nut-galls, which are often ingredients of hair dyes, the colour may be modified so long as the use of the dyes is continued. In short, oxygen is a great painter, so to speak, though of course it is not the only element which fulfils that rôle. Oxidation at any rate probably accounts for the beautiful autumnal tints of plant life which are lost soon after the leaf reaches the ground, where it rots and a reducing, as opposed to an oxidising, process begins.

THE LISTER INSTITUTE OF PREVENTIVE MEDICINE.

THE governing body of the above institution announces that the necessary legal formalities in connexion with the change of name of this institute have now been completed, the Board of Trade having sanctioned the new name. The institute will therefore now be known as the "Lister Institute of Preventive Medicine." The address, Chelsea-gardens, S.W., remains the same.

AN ANOMALY IN LUNACY PRACTICE.

MOST medical men at some period of their professional careers have had experience of the eccentricities of the English law of lunacy, but probably few are aware that cases arise in which what is in effect a lunacy certificate has to be given by a nurse. We do not here refer to the familiar "facts communicated by others" which are conveniently embodied in the ordinary "certificate of medical practitioner." Such facts are often supplied by the nurse in charge of the patient or by some relative or friend of the latter and little importance is attached to them by the Commissioners in Lunacy. In certain cases, however, the nurse is placed on the same footing as the lunatic's medical attendant. The following circumstances which have come to our notice will serve as an illustration. X, an executor under his mother's will, distributed the estate and afterwards became insane. Further assets then fell in and as X was incapable of dealing with them a sister, one of the residuary legatees, applied for letters of administration. In order that these might be obtained it was necessary to prove the lunacy of X and it is to the form of affidavit required for this purpose that we wish to draw attention. It is a joint and several one beginning thus: "We, A B of ——, surgeon, and C D of ——, nurse, make oath and say respectively as follows." The declaration of the medical man is then given and presents no special feature of interest, but the document proceeds: "and I, the said C D, for myself make oath that I am a nurse at the said lunatic asylum or house for the reception of lunatics where the said X is now confined and that the said X hath been for — years last past confined thereat and has been under my care as a person of unsound mind and that he is a lunatic and totally incapable of managing himself or his affairs." This form of affidavit is employed in accordance with the practice of the Probate, Divorce, and Admiralty Division of the High Court, as stated in Tristram and Coote's standard work, where it is laid down that "when no commission has been taken out or no order has been made in lunacy the court will satisfy itself as to the lunacy by calling for a joint affidavit of the surgeon or physician keeping or visiting the asylum where the patient is confined and of his attendant or nurse." The objections to this procedure should be apparent enough. Anyone who has had practical experience of asylums knows how incompetent the average nurse, male or female, is to express an opinion of any value as to the capacity of a patient for managing his affairs. To bring out the unsatisfactory nature of the present arrangement,

we need only try to imagine the complications which would arise if from stupidity or perversity the nurse refused, in such a case as that outlined above, to join in the affidavit. Ordinarily, of course, she would simply indorse the medical attendant's views, so that her statement would be merely superfluous. If the certificate of the medical adviser alone is considered to be insufficient the rational course is to call in an independent practitioner, as is done when a reception order is asked for.

TURKISH MEDICAL DEGREES FOR FOREIGNERS.

IN our last Students' Number we inadvertently stated that foreigners desirous of taking a Turkish diploma were allowed the use of an interpreter in the course of their examinations. This was an error. Candidates for the Turkish diploma can be examined in Turkish or in French but in neither case are they allowed the services of an interpreter.

TREATMENT OF TRIGEMINAL NEURALGIA BY INJECTIONS OF OSMIC ACID.

IN the *Journal of the American Medical Association* of August 22nd Dr. J. B. Murphy of Chicago relates a case of neuralgia successfully treated by the injection of osmic acid, a method recommended by Sir William H. Bennett.[1] A man, aged 76 years, had suffered from neuralgia in the right side of the face for 13 years. Two years before he came under observation some operation was performed on the right superior maxilla and was followed by complete relief for four months. The pain then returned and occurred at intervals. It was severe and shooting and began at the right ala nasi and radiated into the cheek. There was also pain above the right eyebrow which radiated into the temple. The patient was poorly nourished and his arteries were sclerotic. The supra-orbital and infra-orbital nerves were slightly tender at the foramina of exit. The problem of treatment was difficult. Neurectomy of the affected branches would only give temporary relief. Excision of the nerve trunks external to the cranial foramina or of the Gasserian ganglion was too formidable an operation in the condition of the patient. Dr. Murphy therefore determined to adopt the method described by Sir William Bennett and exactly followed his technique. Under ether osmic acid was injected into the supra-orbital, infra-orbital, and mental nerves on June 11th, 1903. The operation lasted only 25 minutes and the patient recovered well from the anæsthetic. The pain disappeared and up to the date of the last report, July 21st, there had been no recurrence. Sir William Bennett[2] described ten cases which were all treated by injection of osmic acid into the nerve with the most gratifying results. The longest period of relief which he could record at the time of publication of his paper was two years. Even should the pain recur this method is so simple that the operation can easily be repeated.

THE INCREASE OF PAUPERISM.

A RETURN recently issued by the Local Government Board shows that pauperism is still on the increase in this country. On Jan. 1st, 1903, there were, excluding lunatics in asylums, 19,470 more persons in receipt of indoor or outdoor relief than on Jan. 1st, 1902. The increase affects chiefly indoor paupers who show an addition of 3·9 per cent., while the outdoor paupers have only increased in number to the extent of 2 per cent. There has naturally been also an increase in the amount expended by boards of guardians who during the half year ended Lady-day, 1903, had to find, besides the salaries of officers and the cost of repairs and furnishing, a sum of £1,680,332 for indoor maintenance and £1,438,655 for distribution among the poor who were allowed to remain in their own homes. During the same period pauper lunatics in asylums cost a further sum of £1,116,971. As compared with the corresponding period last year the average increase for England and Wales in the way of indoor relief expenditure was about 3 per cent., while for outdoor relief it was 2·8 per cent. For London the figures were respectively 0·08 per cent. and 2·4 per cent., showing an apparent tendency towards diminished stringency of the requirements of relief committees which at first sight may not appear quite satisfactory. It is to be noted, however, that the expense of "boarding out" is included under outdoor relief and the extension of this method of dealing with the children of the poor accounts in part for the figures quoted. No regret need be felt that the "workhouse test" is not applied to children and probably nobody will take exception to an arrangement which keeps them in some measure away from the contaminating influences of our social failures. The number of boards of guardians who are awaking to a due sense of their responsibilities in the matter of pauper children seems to be steadily growing throughout the country. No fewer than 494 now employ the boarding-out system.

THE HOT WELLS, BRISTOL.

IN an annotation entitled "A Provincial Medical Library"[1] we commented upon some researches made into the contents of the library of the Bristol Medico-Chirurgical Society by Mr. L. M. Griffiths, the honorary librarian, and we expressed a hope that Mr. Griffiths would continue his researches. This he has now done and the result is a little treatise called "The Reputation of the Hot Wells (Bristol) as a Health Resort." Mr. Griffiths gives a historical retrospect of the wells the reputation of which goes back to the middle of the fifteenth century. The eighteenth century, however, saw the hot wells at their zenith of fame. For instance, what better advertisement could a health resort have than the following? "Mr. *William Gaggs*, case of *Bristol Castle Green*, a very Fat Man, at his Prime, aged thirty-eight; he was seized with so violent a *Diabeth*, that he made at least three gallons of very sweet Urine with a large quantity of Oil swimming thereon every night and could not sleep for either Drinking or Pissing, which in Six Days (his appetite gone) so run off his Fat and Flesh that he was reduced to helpless Skin and Bones, left off by his Physitians (not sparing any money), and given over by his Wife and Friends for a dead Man. ....." Mr. Gaggs then cast himself resolutely on "God's Mercy and the *Hot Well* Water," a fine instance this of faith as exemplified by works, and paid one visit to the well. The result was that he went home, "eat a large and savoury Meal, and by drinking the water for some time perfectly attained his former State of Health, in all Respects." The hot wells became very fashionable and Dr. Andrew Carrick gives a glowing picture of the fascinations of the place in 1789, when "the sublime scenery of the cliffs was enlivened by the sounds of a band of music." Natural beauty did not appeal to the *beau monde* of the eighteenth century and no doubt the sweet strains of "Water Parted" or the minuet in *Ariadne* had as enlivening an effect upon the fashionable world as they had upon Tony Lumpkin's bear. Mrs. Lybbe Powys who visited the wells in 1779 does not seem to have appreciated the place, for she says: "The dismal brown pump room at the hot wells always fills one with horror. I'm certain its being so dull a one must strike the miserable concourse of invalids always assembled in it with a melancholy not to be erased."[2] In

[1] THE LANCET, Nov. 4th, 1899, p. 1220.
[2] Loc. cit.

[1] THE LANCET, Sept. 21st, 1901, p. 800.
[2] THE LANCET, Sept. 16th, 1899, p. 793.

1816 the prosperity of the hot wells began to decline, probably, as Mr. Griffiths points out, because the quieter state of European politics enabled persons to go to the continental spas. We have read this little book with great pleasure and all the more so as it is illustrated by reproductions of interesting old prints of the neighbourhood.

THE DIAGNOSIS OF NOTIFIABLE DISEASES.

AN example of the trouble which heads of families may bring on themselves by domestic treatment of illness was provided by a case recently investigated at the Coventry petty sessions. A woman was summoned at the instance of Dr. E. H. Snell, medical officer of health of Coventry, for neglecting to notify that her daughter was suffering from small-pox. The town clerk, who conducted the prosecution, said that the patient had probably caught the disease through visiting some friends at Exhall and that 12 cases of small-pox at Birmingham had been traced to that place. The sanitary inspector gave evidence to the effect that in consequence of information received he visited the house of the defendant who at first told him that she had no daughter at home but afterwards admitted that she had a daughter who, she thought, was suffering from measles. No medical opinion had been obtained, but on the advice of the sanitary inspector Dr. T. Webb Fowler was sent for and on the next day the girl was removed to Pinley Hospital where she was found to present obvious symptoms of discrete small-pox with an eruption of about six days' duration. The magistrates commented severely on the defendant's conduct and imposed a fine of £2 with £1 15*s.* 6*d.* costs. According to the published reports the prosecution adopted the view that she knew, or ought to have known, the nature of the disease, because "there could be no mistaking that the case was small-pox." In the present instance it is possible that there may have been wilful concealment, but at all events there was culpable neglect, and it was, we think, in this direction more particularly that the defendant's error lay. She will, perhaps, now be less disposed to rely on a diagnosis made by herself alone and will recognise that an interview with her medical adviser would have been less expensive and less troublesome than an interview with the magistrates.

A TELEGRAM from the Governor of Hong-Kong received at the Colonial Office on Sept. 24th states that for the week ending Sept. 19th there were one case of plague and one death from the disease. The medical officer of health of Cape Colony reports that for the week ending Sept. 5th no case of plague was discovered in the colony. Plague-infected rats were, however, found at Port Elizabeth and on board a ship at East London.

THE Lettsomian lectures of the Medical Society of London will be delivered on Feb. 1st, 15th, and 29th, 1904, by Mr. C. B. Lockwood. The subject is Aseptic Surgery in Theory and Practice. The annual oration will be delivered on May 16th, 1904, by Sir Isambard Owen, and the anniversary dinner will take place at the Whitehall Rooms, Hôtel Métropole, on Tuesday, March 8th, 1904, at 7 P.M.

THE autumn meeting of the Medico-Psychological Association, Northern and Midland Division, will be held by the courtesy of Dr. T. W. McDowall at the Northumberland County Asylum, Morpeth, on Friday, Oct. 9th.

THE annual meeting of the Incorporated Society of Medical Officers of Health will be held at 5 P.M. on Friday, Oct. 9th, at the Holborn Restaurant, London, when Dr. Joseph Groves will deliver his presidential address on Rural Water-Supplies. The annual dinner of the society will take place the same evening at the Holborn Restaurant.

THE memorial stone of the new buildings of the Royal Waterloo Hospital for Children and Women will be laid on Monday, Oct. 26th, at 3 P.M. by H.R.H. the Duchess of Albany.

THE NEW REGULATIONS FOR THE INDIAN MEDICAL SERVICE.

WE publish this week the new regulations for the Indian Medical Service which have just been issued. We recently drew attention to the position of officers of this service in comparison with that of the officers of the Royal Army Medical Corps under the improved Warrant of the latter service, and we may begin our consideration of the new regulations of the Indian Medical Service by stating that the inequality of pay has been to a substantial extent adjusted. Intending candidates for the Indian Medical Service will note that their financial condition, so far as the *military* department is concerned, is much improved, as can be seen by a comparison of the figures in the memorandum now issued (see p. 973) with those in the old Warrant which will be found in the Students' Number of THE LANCET.[1]

But while we would point out that as far as pay generally is concerned there is considerable improvement, the pay of the administrative posts really remains the same, save that the pay of the Director-General is increased from Rs. 2700 per mensem to Rs. 3000 per mensem. And one especial blot remains in the regulations. In paragraph 23 of the new Warrant it is still laid down that "No officer, however employed, can receive any staff allowance in addition to the pay laid down in paragraph 16 unless he has passed the examination in Hindustani known as the 'Lower Standard.'" This is manifestly unfair, as anyone conversant with the conditions of service in India must at once acknowledge. An officer on arrival in the country may be immediately sent to some remote station where he can obtain the services of no instructor and thus he may find it impossible to pass the examination. The examination is by no means so simple a test as it was, and it is surely unfair that a young medical officer, through no fault of his own, should be precluded, perhaps for a long time, from earning his proper pay. A young staff corps officer posted to a native regiment receives full pay for one year pending his passing his examination in languages, and the same privilege—or, rather, the same commonsense treatment—should be extended to the young officer of the Indian Medical Service.

Amongst other changes in the Warrant we notice that a lieutenant has to pass in military law and military organisation before promotion to the rank of captain. This, we think, is a wise provision to insure that an officer shall be cognisant of these matters. Another change is that an officer can receive both substantive and brevet promotion for distinguished conduct in the field. Formerly the promotion thus granted was not so definitely stated as substantive or brevet. Again, specialist pay of Rs. 60 per mensem is now granted to officers below the rank of lieutenant-colonel who may be appointed to certain posts. But what are the posts and how many are there of them? This is a concession which reads well and means very little, for there are, we believe, scarcely half a dozen such appointments. Extra furlough is also granted to officers desirous of pursuing a special course of study at the rate of one month's furlough for each year. The pensions are likewise increased; thus, that for 20 years' service is now to be £400 instead of £365; that for 17 years' service £300 instead of £292; whilst a lieutenant-colonel who has been especially selected for increased pay, if he attains the age of 55 years before he becomes entitled to the pension of 30 years'

[1] THE LANCET, Sept. 5th, 1903, p. 727.

service, may be retained until the completion of such service. This arrangement still leaves unredressed to a large extent the grievance upon which we have recently laid stress, and which is properly emphasised in the memorandum of the British Medical Association upon the conditions of employ in the Indian Medical Service. The officer who enters the service when he is only a day over 25 years of age forfeits almost to a certainty his chance of ever reaching a higher pension than £500 per annum.

But while we allow that, with the reservations we have just made, the pay of the *military* department of the Indian Medical Service has been substantially improved, we must point out that the conditions of *civil* employment are practically unaltered in the new regulations, although three-fifths of the service are in civil employ. Paragraph 19 of the new regulations repeats the instructions that have been in force for at least a quarter of a century, and we can nowhere see any promise of amelioration. There is already considerable difficulty in getting candidates to pass from the military side into civil employ, and with the pay of the military side improved this difficulty will be much enhanced. Again, to make the service thoroughly satisfactory and to remove a totally unmerited stigma from the character of its officers, we would strongly urge the Secretary of State for India to insist on the cancelling of the order that an officer of the Indian Medical Service should refer the question of the amount of his fees, when above a certain low limit, to the civil authority. No similar proceeding is ordered in any other service in India or elsewhere and the suggestion that without some such restriction unfair or exorbitant fees would be charged is most unfortunate.

We note next that both "unemployed pay" and "grade pay" are mentioned. We trust "unemployed pay" will not be brought into being in its old fashion. Until a comparatively recent time a surgeon was often in the position of an "unemployed employé"—that is to say, he was fully employed as regards his duty while receiving only unemployed pay. But it must be pointed out that the unemployed pay is on a distinctly generous scale, the only grievance that can be alleged in this respect being that occasionally men are left too long upon it. This is a position which would greatly right itself if only the young officers of the Indian Medical Service were put upon their proper pay at once instead of being obliged to wait until they had passed an examination in languages for the study of which they are often given no proper opportunities. The unemployed pay of the Indian Medical Service is fair in comparison with similar pay of other officers but this is not the case with the allowances made to officers on furlough. The maximum allowance to officers of the Indian Medical Service on furlough is £500 per annum, whereas the maximum allowance to officers of the Indian Army is £700. What is the reason for this discrepancy?

Again, the rule that the office of principal medical officer to His Majesty's forces may be held by an officer of either service should be observed in actual fact as well as in the letter. More native troops are under arms than British, hence if there is such a rule in being, why should it not be carried out? The rolls of the Indian Medical Service have furnished men who would have been excellently qualified to be the official heads of their service and as long as the reverse policy is pursued the Indian Medical Service has a distinct grievance. And while we have noted with pleasure the increased pay of the Director-General of the Indian Medical Service, we wish that we could also see in the new regulations provision for an improvement in his rank and status. The rank of the Director of the Indian Medical Service should be increased from that of major-general to that of lieutenant general in accordance with the similar concession that has been made to the Director-General of the Army Medical Service, while he should, by virtue of his office, have a seat on the Vice Regal Council. The surgeon-generals of the several provinces should similarly sit on the Councils of the Lieutenant-Governors. If medical views could be placed directly before the rulers of the Indian empire, and if the reasons for medical suggestions could be personally explained to the heads of the legislative machinery, not only would much needless friction be abolished, but more efficacious work could be done. Of this we are certain, while no reform that the Indian Government could bring forward would work more quickly in restoring to the Indian Medical Service its great prestige and popularity.

ANNUAL REPORT (1901-02) OF THE MEDICAL OFFICER OF THE LOCAL GOVERNMENT BOARD.[1]

II.

AN important and most instructive section of the medical officer's report is that which deals with the administrative action of the Local Government Board in regard to the prevention of disease. Long anterior to the period when it came within the sphere of practical politics to require under penalty from the public notification to the sanitary authorities of all cases of dangerous infectious disease a large share of the attention of the inspecting staff of the Board had been devoted to the investigation of particular local prevalences of epidemic disease. The detailed reports of these inspections, collated and commented on by the medical officers—first of the Privy Council and afterwards of the Local Government Board—have accumulated year by year until at the present time they form a small library of preventive medical literature of unique value not only for the instruction of students of etiology but for the guidance and encouragement of the local authorities who are charged by the Legislature with the preservation of the public health.

Our readers will remember that in the course of the last quarter of a century, with the object of controlling the spread of infection, certain of the more public-spirited of the sanitary authorities have obtained under local Acts powers to acquire prompt knowledge concerning individual attacks of dangerous infectious disease. It is only recently, however, that public opinion has become ripe enough to allow of the passing of a general Act for the compulsory notification of such diseases throughout the country.

For several years past the annual reports of the medical officer of the Board have contained summaries of cases of infectious disease notified in the principal urban districts. But since the passing of the Notification Act advantage has been taken of the issue of quarterly returns by the Registrar-General to publish therein, instead of in the annual reports of the Board, particulars of infectious cases occurring in the chief towns of England. This change was initiated in 1901 at the suggestion of the Incorporated Society of Medical Officers of Health, which naturally contended that advantage to local sanitary administration would accrue from the issue of this important local information with the least possible delay. The tabular statements as to the notification of sickness now issued every quarter include almost all the urban areas in regard to which the Registrar-General publishes quarterly returns of mortality. These urban areas, 169 in number, include all the towns of more than 25,000 inhabitants; the population thus dealt with is therefore considerably more than half that of England and Wales. That the statements are not complete as regards the Registrar-General's urban areas is in the main due, Mr. W. H. Power tells us, to the refusal of the authorities of certain health resorts to contribute information as to infection and sickness in their areas for publication in the way proposed to them. The attitude of these authorities is to be regretted. Their abstention in the matter is liable to be construed by intending visitors to the detriment of the districts concerned.

We have space to notice only a few of the more important of the inquiries made by the medical inspectors of the Board during 1901-02, but it is noteworthy that the inquiries selected by Mr. Power for special remark are typical of cases constantly recurring in sanitary experience, cases in which either present or past neglect of obvious sanitary precautions has led—either by persistent excremental fouling of the subsoil or by overcrowding of unhealthy dwellings on area—to the establishment of insanitary conditions in which recurring outbursts of epidemic disease may be looked for as matters of natural consequence.

Of the local inquiries here referred to nine were in connexion either with epidemic outbreaks or with recurrent prevalences of enteric fever and eight with occurrences of diphtheria. Among the former the state of things reported by Dr. Theodore Thomson as obtaining at Folkestone may be regarded as representative of conditions that prevail

[1] The first notice was published in THE LANCET of Sept. 19th, 1903, p. 839.

likewise at many other health resorts—conditions which favour the extension not of enteric fever alone, but of epidemic diarrhœa, diphtheria, and other epidemic diseases which in their absence would have been powerless for evil. Thus, Dr. Thomson, in reviewing the facts brought to light in his inspection of Folkestone advances as a probable explanation of the recurrence of enteric fever the view that the infective material of this disease, finding its way in considerable amount into Folkestone in 1896 by means of milk, and being on subsequent occasions re-inforced in similar fashion, continued there in amount and under conditions that favoured the propagation of the disease. Among these conditions are to be reckoned the existence of faulty sewers and house drains. Such sewers and drains would, by permitting soakage of their contents into the surrounding ground, facilitate access of the fever material to the neighbourhood of human habitations. Similarly typical of what sometimes obtains, especially in small towns, to the detriment of administrative efficiency, is the overlapping of function among sanitary officials. Thus Dr. Thomson reports with respect to the internal administration of the Folkestone health department that it is far from satisfactory. This is due to the relation in which the medical officer of health and the inspector of nuisances stand to one another. The latter officer, who is active and zealous in the discharge of his duties, is apt to deal with questions which are not within the province of the inspector of nuisances and to take independent action in matters in which supervision by the medical officer of health is necessary. An illustration of this regrettable condition of affairs is afforded by the fact that the medical officer of health and the inspector of nuisances have reported separately to the health committee as to the causation of the recent serious occurrences of enteric fever at Folkestone. These two officers differ in their conclusions, the medical officer of health attributing a material amount of the fever to defective conditions of sewerage and drainage in Folkestone, whilst the inspector of nuisances does not share this view. It is no part of the duties of an inspector of nuisances to report upon the etiology of questions involving medical considerations and it is much to be deplored that the local authority should have allowed such a procedure.

Nor are unsatisfactory arrangements of the kind here referred to by any means confined to the smaller urban communities. In more than one instance we have heard of a large and populous city which appeared (on paper) to be equipped with a sanitary organisation sufficient in all respects for local requirements, but in which sanitary administration was paralysed after the manner above indicated. In populous towns the salary paid to the chief inspector of nuisances is considerable and it unfortunately happens that the officer appointed to this post frequently exercises undue influence on the governing body which is thus too commonly led to support its inspector in his usurpation of functions which can only properly be performed by the medical officer of health.

The circumstances brought to light in respect of local sanitary administration in the course of certain of the medical inspections ordered by the Board with respect to local prevalences of diphtheria are not more reassuring than those to which we have already referred. As to the eminently unsatisfactory state of affairs which still obtains in certain rural districts, Dr. S. W. Wheaton's report concerning the sanitary condition of the town of Fishguard and of the village of Goodwick and the connexion therewith of the prevalence of diphtheria in 1901 bears abundant testimony. The defective administration of the Haverfordwest rural district council has for some years been under the notice of the Local Government Board and the appearance of diphtheria in Goodwick in 1901 was the occasion of its active intervention. Dr. Wheaton reports, *inter alia*, that neither isolation nor disinfecting apparatus is provided in this district, while nuisances generally are permitted to go unabated. In Fishguard, one of the areas invaded by diphtheria, an accumulation of sewage was observed on the foreshore, many dwellings were without house drains, and liquid filth appeared to be cast indifferently upon garden ground, into the streets, and into gullies in connexion with highway drains. The pail privies of the place were found to be neglected and filthy and where these conveniences were wanting excrement polluted the ground. At Goodwick the state of affairs was equally unsatisfactory. In the Fishguard schools "sore throat" had prevailed among the children for a year or more antecedently to the outbreak of diphtheria. When the drains in relation with the school were examined at the outbreak of definite diphtheria these were found to be blocked and the subsoil about the school was much polluted by leakage from them. In his attempt to trace the history of the diphtheria Dr. Wheaton was altogether foiled, the notification certificates of the cases of diphtheria having been destroyed and no records of the facts respecting these cases having been kept. Action of the district council in prevention of the spread of diphtheria appears to have been limited practically to closure for three weeks of the Fishguard school and to exclusion of certain scholars from the Goodwick school. No disinfection of the clothing or of the dwellings of patients suffering from diphtheria had been practised. Well may Mr. Power remark, in summarising the teachings of Dr. Wheaton's report, that as a whole the story of Fishguard and Goodwick is one of the least satisfactory that has in recent years come to the notice of the Board. We only wish we could assure ourselves that the circumstances above described are limited to the district of Haverfordwest.

In addition to, or in association with, advice offered by the inspectors of the Board in respect of actual outbursts of epidemic disease, their assistance was frequently required during the year for the redress of general sanitary shortcomings on the part of local authorities. For example, in the autumn of 1901 the town council of Whitehaven made application to the Board for an inspection of the district in consequence of a recent outbreak of fever. After careful inquiry Dr. H. T. Bulstrode, who was commissioned for the purpose, was able to eliminate the ordinary supplies of food, water, and milk as having causal relation to the outbreak. On the other hand, the sanitary condition of the town was such as to call for special attention and amendment. Dwellings were crowded together, drains were generally faulty, and the water-closet accommodation was deficient and sometimes very defective. In fact the sanitary arrangements of part of Whitehaven were exceedingly faulty. "Wherever one turns," writes Dr. Bulstrode, "whether out of the small or the large thoroughfares, one finds deplorable courts and alleys where the direct rays of the sun are but rarely seen, and where even its diffused light is often difficult of attainment. The demand for dwelling houses at a time of unusual prosperity appears to be responsible for this overcrowding of houses; it was then (in the absence of proper building by-laws) that the gardens and backyards of the houses then existing were handed over to the enterprising builder, who soon converted every available patch of ground into a court or alley." The overcrowding referred to was unique in the inspector's experience.

(To be concluded.)

THE INDIAN MEDICAL SERVICE.

As we informed our readers recently, new regulations for the Indian Medical Service were under the consideration of the Government and their publication might shortly be expected. The following memorandum showing the alterations to be effected in the conditions of the service has now been forwarded to us for publication. The grievances in the service as we formulated them in the Students' Number of THE LANCET[1] are to some extent remedied, but we doubt if the alterations will completely restore the confidence of the medical profession:—

MEMORANDUM REGARDING THE POSITION OF OFFICERS TO BE APPOINTED TO HIS MAJESTY'S INDIAN MEDICAL SERVICE.

India Office, October, 1903.

1. This memorandum is based on the regulations in force at the present time. They are subject to any alterations that may be determined on.

PASSAGE TO INDIA.

2. Officers on appointment are, when possible, provided with passage to India by troop transport; when such accommodation is not available passage at the public expense is provided by steamer, or a passage allowance granted if preferred. A charge for messing during the voyage is made at the rate of 2*s.* a day. This payment does not include the cost of liquors, which are charged for as extras.

3. Any officer who may neglect or refuse to proceed to India if ordered to do so within two months from the date of leaving Netley, or within 14 days of the termination of his hospital appointment if the Secretary of State for India has permitted him to hold one, will be

[1] THE LANCET, Sept. 5th, p. 727.

considered as having forfeited his commission, unless special circumstances shall, in the opinion of the Secretary of State in Council, justify a departure from this regulation.

PAY PREVIOUS TO ARRIVAL IN INDIA.

4. The rate of pay drawn by lieutenants of the Indian Medical Service previous to arrival in India is 14*s.* a day, but a lieutenant (1) who has been permitted by the Secretary of State to hold a hospital appointment will receive no pay while holding it; (2) who is detained by illness in this country will be paid at the rate of £200 a year from the date on which he would otherwise have embarked until the date of embarkation and at the rate of 14*s.* a day during the voyage to India. (For rates subsequent to their landing in India, *see* paras. 16, 17, and 18).

Pay at the above rate is issued in this country up to the date of embarkation, and an advance of two months' pay at the same rate is also made prior to embarkation, which is adjusted in India in accordance with the rate laid down in para. 16.

GRADES AND PRECEDENCE.

5. The grades of officers in the Indian Medical Service are six in number, viz: 1. Surgeon-general. 2. Colonel. 3. Lieutenant-colonel. 4. Major. 5. Captain. 6. Lieutenant.

PROMOTION.

6. A lieutenant's commission dates from the day on which his course of instruction commences.

7. A lieutenant may be promoted to captain on completion of three years' full-pay * service from date of first commission but after completing 18 months' service and before promotion to the rank of captain he will be required to pass an examination in military law and military medical organisation, the result of which may affect his promotion.

8. A captain is promoted to major on completion of 12 years' full-pay * service.

9. A major is promoted to lieutenant-colonel on completion of 20 years' full-pay * service.

* *See*, however, para. 42.

10. All promotions from the rank of lieutenant-colonel to that of colonel, and from the rank of colonel to that of surgeon-general, are given by selection for ability and merit.

11. On appointment as honorary physician or honorary surgeon to His Majesty an officer below the rank of colonel is promoted to that rank, remaining supernumerary until absorbed.

12. For distinguished service in the field an officer of the Indian Medical Service may receive substantive or brevet promotion.

TENURE OF OFFICE IN ADMINISTRATIVE GRADES.

13. The tenure of office of surgeon-generals and colonels is limited to five years.

14. Colonels, if not disqualified by age, are eligible either for employment for a second tour of duty in the same grade or for employment in the higher grade of surgeon-general by promotion thereto.

15. Absence on leave in excess of eight months during a five years' tour of duty involves forfeiture of appointment.

PAY AND ALLOWANCES.*

16. The following are the monthly rates of Indian pay drawn by officers of the Indian Medical Service from the date of their arrival in India:—

Rank.	Unemployed pay.	Grade pay.	Staff pay.	In officiating medical charge of a regiment.	In permanent medical charge of a regiment.
	Rs.	Rs.	Rs.	Rs.	Rs.
Lieutenant	420	350	150	425	500
Captain	475	400	150	475	550
,, after 5 years' service ...	475	450	150	525	600
,, after 7 years' service ...	—	500	150	575	650
,, after 10 years' service	—	550	150	625	700
Major...	—	650	150	725	800
,, after 15 years' service ...	—	750	150	825	900
Lieutenant-Colonel	—	900	350	1075	1250
,, after 25 years' service	—	900	400	1100	1300
,, specially selected for increased pay	—	1000	400	1200	1400

NOTES.—*a.* Unemployed pay is drawn by officers of less than seven years' service who are not holding officiating or substantive charge of native regiments. Officers of more than seven years' service draw grade pay alone when unemployed. Staff pay is the pay of a command and is drawn in addition to grade pay.

b. Horse allowance is granted to officers in substantive charge of cavalry regiments at the rate of Rs. 90 a month to lieutenant-colonels and majors and Rs. 60 a month to captains and lieutenants.

* Note to paras. 16 to 20.—Under present arrangements officers of the Indian Medical Service who are not statutory natives of India receive exchange compensation allowance to compensate them for the fall of the value of the rupee. The allowance consists of an addition to their salaries (subject to certain limitations) equal to half the difference between their salaries converted at (1) 1*s.* 6*d.* the rupee and (2) the average market rate for each quarter.

17. The principal administrative appointments are held by colonels and surgeon-generals on the following consolidated salaries:—

Colonel, from Rs. 1800 to Rs. 2250 per mensem.
Surgeon-general, two at Rs. 2200 ,,
,, ,, Rs. 2500 ,,
,, one at Rs. 3000 ,,

18. Specialist pay he rate of Rs. 60 a month is granted to officers below the rank of lieutenant-colonel who may be appointed to certain posts.

19. The salaries of other substantive medical appointments in the civil and military departments are consolidated and vary from Rs. 400 to Rs. 1800 per mensem.

20. Qualified officers of the medical service are also eligible for appointments in the assay department. The salaries of these appointments are from Rs. 600 to Rs. 2250 per mensem.

21. Officers are required to perform two years' regimental duty in India before they can be considered eligible for civil employment.

22. Except in the administrative grades and in certain special appointments, medical officers are not debarred from taking private practice, so long as it does not interfere with their proper duties.

23. No officer, however employed, can receive any staff allowance in addition to the pay laid down in para. 16 unless he has passed the examination in Hindustani known as the "Lower Standard." The passing of this examination does not of itself bring any increase of pay to an officer, unless appointed to a substantive or officiating charge; but failure to pass disqualifies an officer, even when holding such substantive or officiating charge, from receiving any portion of the staff allowances of the appointment.

24. Surgeon-generals and colonels, on vacating office at the expiration of the five years' tour of duty, are permitted to draw *in India* an unemployed salary of Rs. 1200 per mensem in the former and Rs. 900 in the latter case, for a period of six months from the date of their vacating office, after which they are placed while unemployed on the following scale of pay:—

—	Surgeon-general. Per diem.	Colonel. Per diem.
	£ *s.* *d.*	£ *s.* *d.*
After 30 years' service on full pay	2 5 0	1 14 0
,, 25 ,, ,, ...	2 5 0	1 10 0
,, 20 ,, ,, or on promotion, should this period of service not be completed...	2 0 0	1 8 0

LEAVE RULES.

(*Paras.* 25 (2) *to* 29 *apply only to Officers in Military employ.*)

25. Officers of the Indian Medical Service, below the rank of colonel, may be granted:—

(1) Privilege leave under such regulations as may from time to time be in force.

(2) Leave out of India, for no longer period than one year, capable of extension to two years' absence from duty, on the following pay:—

	£ a year.
After arrival in India, on first appointment	200
After the commencement of the fifth year of service for pension ...	250
,, ,, tenth ,, ,, ...	3
,, ,, fifteenth ,, ,, ...	400
,, ,, twentieth ,, ,, ...	450
,, ,, twenty-fifth ,, ,, ...	50

(3) Leave in India, but for the period of one year only, on full military pay and half the staff salary of appointment.

26. No extension of leave involving absence from duty for more than two years, whether taken in or out of India, can be granted except on specially urgent grounds and without pay.

27. An officer unable on account of the state of his health to return to duty within the maximum period of two years' absence, unless he is under para 26 specially granted an extension of leave without pay, is placed on temporary half pay or the retired list, as the circumstances of the case may require. An officer is also liable to be placed on half pay or the retired list should his health require an undue amount of leave, whether in or out of India.

28. Leave may be granted at any time, but solely at the discretion of the civil or military authorities in India under whom an officer may be serving.

29. An officer on leave, whether in India or out of India, is required to rejoin at once on being recalled to duty, unless certified by a medical board as unfit to do so.

30. Officers of the administrative grades may be granted one period of leave not exceeding eight months during their tenure of appointment.

31. Extra furlough may be granted to officers desirous of pursuing special courses of study at the rate of one month's furlough for each year's service up to 12 months in all.

HONOURS AND REWARDS.

32. Officers of the Indian Medical Service are eligible for the military distinction of the Order of the Bath and for other orders, British and Indian, and for good service pensions.

Six of the most meritorious officers are named honorary physicians and six are named honorary surgeons to His Majesty.

RETIRING PENSIONS AND HALF PAY.

33. Officers of the Indian Medical Service are allowed to retire on the following scale of pension on completion of the required periods of service:—

	Per annum.
After 30 years' service for pension	£700
,, 25 ,, ,, ...	500
,, 20 ,, ,, ...	400
,, 17 ,, ,, ...	300

34. Service for pension reckons from date of first commission, and includes all leave taken under the rules quoted in paras. 25 to 30. (See also para. 42.)

35. A surgeon-general, after three years' active employment in India in that appointment, is entitled to retire upon a pension of £350 per annum, in addition to that to which he may be entitled under the above scale.

36. A colonel is entitled, after three years' active employment in India in that appointment, to retire upon a pension of £125 per annum in addition to the pension to which he may be entitled under the above scale, and after five years of such employment on an additional pension of £250 in all.

37. In each of the above cases stated in paras. 35 and 36 eight months' absence on leave is allowed to count towards actual service in these grades. (See para. 30.)

38. A surgeon-general or colonel who has completed his term of service and has reverted to British pay may reside in Europe, at the same time qualifying for higher pension.

39. With a view to maintain the efficiency of the service, all officers of the rank of lieutenant-colonel and major are placed on the retired list when they have attained the age of 55 years and all surgeon generals and colonels when they have attained the age of 60 years. But a lieutenant-colonel who has been specially selected for increased pay if he attains the age of 55 years before he becomes entitled to the pension for 30 years' service may be retained until completion of such service; and in any special case where it would appear to be for the good of the service that an officer should continue in employment he may be so continued, subject in each case to the sanction of the Secretary of State for India in Council.

40. Officers placed on temporary or permanent half pay under para. 27 are granted the British rate of half pay of their military rank, as under.

Rank.	Rates of half pay.	
	Per diem.	Per annum.
	s. d.	£ s. d.
Lieutenant-Colonel	11 0	200 15 0
Major	9 6	173 7 6
Captain	7 0	127 15 0
Lieutenant	3 0	54 15 0

Officers cannot retire *in India* on half pay (No. 45, 28th February, 1865).

INVALID PENSIONS.

41. An officer who has become incapacitated for further service in India on account of unfitness caused by duty may, after he has been two years on temporary half pay, be granted an invalid pension on the following scale:—

	Per annum.
After 16 years' pension service	£272
,, 15 ,, ,, ,, ...	252
,, 14 ,, ,, ,, ...	232
,, 13 ,, ,, ,, ...	212
,, 12 ,, ,, ,, ...	192

42. Time (not exceeding one year) passed on temporary half pay reckons as service for promotion and pension in the case of an officer placed on half pay on account of ill-health contracted in the performance of military duty.

43. Officers of the Indian Medical Service are liable, after retirement on pension before completing 30 years' service, to recall to military duty in case of any great emergency arising, up to 55 years of age.

WOUND PENSIONS.

44. Officers are entitled to the same allowances on account of wounds received in action and injuries sustained through the performance of military duty otherwise than in action as are granted to combatant officers of His Majesty's Indian Military Forces holding the corresponding military rank.

FAMILY PENSIONS.

45. The claims to pension of widows and families of officers are treated under the provisions of such Royal Warrant regulating the grant of pensions to the widows and families of British officers as may be in force at the time being.

46. The widows and families of officers are also entitled to pensions under the Indian Service Family Pension Regulations, for the benefits of which all officers must, as a condition of their appointment, subscribe from the date of their arrival in India.

THE CENTRAL MIDWIVES BOARD.

A MEETING of the Central Midwives Board was held at the boardroom, 6, Suffolk-street, Pall-mall, S.W., on Sept. 24th, when among the business transacted was the following.

Dr. F. H. Champneys was re-elected chairman of the Board until the first meeting in the month of April, 1904. A letter was read from the Clerk of the Council inclosing a sealed copy of the rules as approved by the Privy Council on August 12th, 1903. The secretary reported that the rules and forms were now printed and ready for publication and were on sale at Messrs. Spottiswoode and Co.'s, Limited, 54, Gracechurch-street, E.C., and 5, New-street-square, E.C. The prices were: rules (paper covers) 6*d.*, post free 7*d.*; stiff boards 8*d.*, post free 9*d.*; forms 1*d.* each. The secretary was instructed to complete the registration of the rules and forms so as to preserve the copyright. Applications were read from registered medical practitioners for recognition as teachers under Section C (3) of the rules. The secretary was directed to obtain further particulars from the applicants. The "Suggestions to County and County Borough Councils" as to the working of the Act (including the delegation of powers) were further considered and amended. The secretary was instructed to inform the county councils that the suggestions would, when finally approved, be forwarded to any council desiring a copy.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN 76 of the largest English towns 8229 births and 4707 deaths were registered during the week ending Sept. 26th. The annual rate of mortality in these towns, which had been 15·7, 15·8, and 16·5 per 1000 in the three preceding weeks, declined again last week to 16·3 per 1000. In London the death-rate was 15·4 per 1000, while it averaged 16·7 per 1000 in the 75 other large towns. The lowest death-rates in these towns were 5·3 in Hornsey, 7·1 in Devonport, 7·6 in Tottenham, 8·0 in East Ham, 8·2 in Handsworth and in King's Norton, 9·7 in Newport (Mon.), and 9·8 in Wallasey; and the highest rates were 21·0 in Rotherham, 21·4 in Hanley and in Newcastle-on-Tyne, 22·5 in Middlesbrough, 23·2 in Hull, 23·4 in York, 24·0 in Bootle, and 24·7 in Merthyr Tydfil. The 4707 deaths in these towns last week included 752 which were referred to the principal infectious diseases, against 973, 924, and 918 in the three preceding weeks; of these 752 deaths, 528 resulted from diarrhœa, 57 from whooping-cough, 54 from diphtheria, 47 from "fever" (principally enteric), 40 from scarlet fever, 23 from measles, and three from small-pox. No death from any of these diseases was registered last week in Hornsey, Hastings, Burton-on-Trent, King's Norton, Wallasey, Barrow-in-Furness, or West Hartlepool; while they caused the highest death-rates in Willesden, West Ham, Bootle, Burnley, Preston, Middlesbrough, and Merthyr Tydfil. The greatest proportional mortality from measles occurred in Blackburn; from scarlet fever in Grimsby, Bootle, Tynemouth, Rhondda, and Swansea; from diphtheria in Leyton and Burnley; from whooping-cough in Coventry and Newport (Mon.); from "fever" in Grimsby and Merthyr Tydfil; and from diarrhœa in Willesden, West Ham, West Bromwich, Aston Manor, Stockport, Bolton, Burnley, Preston, Rotherham, and York. Of the three fatal cases of small-pox registered in the 76 towns last week, one belonged to London, one to Birmingham, and one to Liverpool. The number of small-pox patients under treatment in the Metropolitan Asylums hospitals, which had been 49, 46, and 41 at the end of the three preceding weeks, had further declined to 29 at the end of last week; one new case was admitted during the week, against six, nine, and seven in the three preceding weeks. The number of scarlet fever cases in these hospitals and in the London Fever Hospital on Saturday last, Sept. 26th, was 1886, against 1796, 1772, and 1803 on the three preceding Saturdays; 293 new cases were admitted last week, against 229, 212, and 261 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 123, 122, and 128 in the three preceding weeks, further rose last week to 134, but were five below the number in the corresponding period of last year. The causes of 51, or 1·1 per cent., of the deaths in the 76 large towns last week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in West Ham, Leicester, Nottingham, Bradford, Leeds, and in 47 other smaller towns; the largest proportions of uncertified deaths were recorded in Birmingham, Liverpool, Bootle, Manchester, and Gateshead.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in eight of the principal Scotch towns, which had been 16·6, 14·4, and 16·1 per 1000 in the three preceding weeks, further increased to 16·8 per 1000 during the week ending Saturday last, Sept. 26th, and was 0·5 per 1000 in excess of the mean rate during the same period in the 76 large English towns. The rates in the eight Scotch towns ranged from 12·0 in Greenock

and 13·1 in Leith to 18·6 in Perth and 20·1 in Dundee and in Aberdeen. The 550 deaths in these towns included 44 which were referred to diarrhœa, nine towhooping-cough, eight to diphtheria, seven to "fever," five to measles, and four to scarlet fever, but not one from small-pox. In all, 77 deaths resulted from these principal infectious diseases last week, against 88, 77, and 51 in the three preceding weeks. These 77 deaths were equal to an annual rate of 2·4 per 1000, which was 0·2 per 1000 below the mean rate last week from the same diseases in the 76 large English towns. The fatal cases of diarrhœa, which had been 58, 52, and 19 in the three preceding weeks, rose again last week to 44 of which 22 occurred in Glasgow, six in Aberdeen, four in Dundee, four in Paisley, three in Edinburgh, two in Leith, and two in Greenock. The deaths from whooping-cough, which had been nine, nine, and 10 in the three preceding weeks, declined again to nine last week, and included seven in Glasgow. The fatal cases of diphtheria, which had been four, two, and six in the three preceding weeks, further rose last week to eight, of which four were registered in Glasgow and two in Edinburgh. The seven deaths from "fever" were two in excess of the number in the peceding week and were all recorded in Glasgow. The fatal cases of measles, which had been four, six, and eight in the three preceding weeks, declined again last week to five, of which four occurred in Glasgow, where also two of the four deaths from scarlet fever were registered. The deaths referred to diseases of the respiratory organs in these towns, which had been 54, 52, and 71 in the three preceding weeks, further rose last week to 84, but were slightly below the number in the corresponding period of last year. The causes of 18, or more than 3 per cent., of the deaths registered in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 15·4, 18·7, and 19·5 per 1000 in the three preceding weeks, further rose to 27·1 per 1000 during the week ending Sept. 26th. During the past four weeks the death-rate has averaged 18·8 per 1000, the rates during the same period being 15·1 in London and 15·3 in Edinburgh. The 158 deaths of persons belonging to Dublin registered during the week under notice were 16 in excess of the number in the preceding week and included 16 which were referred to the principal infectious diseases, against 16, 10, and 17 in the three preceding weeks; of these, 14 resulted from diarrhœa, one from diphtheria, and one from "fever," but not one from small-pox, measles, scarlet fever, or whooping-cough. These 16 deaths were equal to an annual rate of 2·2 per 1000, the death-rates last week from the principal infectious diseases being 2·1 in London and 1·1 in Edinburgh. The fatal cases of diarrhœa, which had been 10, seven, and five in the three preceding weeks, rose again to 14 last week. The 158 deaths in Dublin last week included 43 of children under one year of age and 45 of persons aged 60 years and upwards; the deaths both of infants and of elderly persons were considerably in excess of the numbers in the preceding week. One death from violence and five inquest cases were registered, and 47, or more than a third, of the deaths occurred in public institutions. The causes of five, or more than 3 per cent., of the deaths registered in Dublin last week were not certified.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointment is announced:—Fleet Surgeon H. W. Macnamara to the *Sans Pareil*.

ROYAL ARMY MEDICAL CORPS.

Surgeon-General W. S. M. Price, on vacating his appointment as principal medical officer of Bombay and Surgeon-General T. O'Farrell have arrived home from India. Lieutenant-Colonel R. Porter has left Woolwich.

Lieutenant-Colonel George Deane Bourke, now serving as principal medical officer of the Peshawur District, India, has been appointed in a similar capacity to Devonport in place of Colonel R. Exham, C.M.G., retired.

VOLUNTEER CORPS.

Rifle: 9th Volunteer Battalion (Highlanders) the Royal Scots (Lothian Regiment): The undermentioned Surgeon-Lieutenants to be Surgeon-Captains:—K. MacK. Douglas (dated August 14th, 1903), J. Mowat (dated August 31st, 1903), and J. Cumming (dated August 31st, 1903). 2nd Volunteer Battalion the Oxfordshire Light Infantry: Surgeon-Captain J. O. Sankey to be Surgeon-Major (dated Sept. 26th, 1903). 1st Dumbartonshire: Farquhar Gracie to be Surgeon-Lieutenant (dated Sept. 26th, 1903). 19th Middlesex (Bloomsbury): Surgeon-Captain J. G. Fraser to remain Supernumerary whilst in command of the 5th London Volunteer Infantry Brigade Bearer Company (dated July 25th, 1903).

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

The Manchester Companies: Lieutenant R. W. Beesley to be Captain (dated Sept. 9th, 1903).

VOLUNTEER INFANTRY BRIGADE BEARER COMPANIES.

5th London: Supernumerary Lieutenant J. G. Fraser (Surgeon-Captain, 19th Middlesex Volunteer Rifle Corps) to be Captain and to command under paragraph 55A Volunteer Regulations (dated July 25th, 1902).

DEATHS IN THE SERVICES.

Fleet Surgeon Albert Charles Queely, R.N. (retired), on Sept. 23rd, aged 55 years. He was appointed surgeon in 1872, was promoted to staff surgeon in 1884, fleet surgeon in 1893, and retired a year later. For his services during the Chilian and Peruvian war of 1879-81 at the hospitals at Lima he received the approval of the Admiralty and the thanks of the Provisional Government of Peru.

Lieutenant George Frederick Humphreys, I.M.S., at Poona, India, on Sept. 26th in his twenty-fourth year.

Correspondence.

"Audi alteram partem."

NOTIFICATION OF ADULTERATED MILK.

To the Editors of THE LANCET.

SIRS,—The fraudulent and pernicious practice of adulterating milk is as rife as ever and is likely to continue so until some more effective and constant method is employed to bring the culprits within the four corners of the law which as at present administered is by far too lenient to deter the offenders from pursuing their nefarious practice. Therefore there cannot be two opinions as to the necessity of propounding a scheme by which the practice can be lessened, if not absolutely wiped out. As matters now stand the duty of detecting the offenders is practically in the hands of the police who have unsurmountable difficulties to contend with and it might be interesting to point out a few of them. For instance, a town of 10,000 inhabitants is officered by a staff of ten policemen who are responsible for the good government of the place both day and night. The number of milk-vendors hailing from the surrounding farms can be computed at 40; they distribute their milk twice daily, making a total of 80 distributions which embody the produce of 80 milkings; therefore to insure the detection of the adulteration of any one of the milkings would necessitate the analysing of 80 samples daily, or 29,200 in the year, figures which far exceed the possibility of being dealt with by the five out of the ten policemen who are on day duty. Another prohibitive barrier would be the enormous expense, which for analysis alone at 10*s.* 6*d.* per sample would amount to the respectable sum of £15,330 per annum, without taking into consideration the expense of engaging the services of an extra number of police, the present force being able to deal only with an infinitesimal proportion of the samples of milk delivered by the vendors. For instance, taking a town of 10,000 inhabitants, with 80 milkings delivered daily, not more than 50 samples would be submitted for analysis during the year, of which an average of 15 per cent. would be found adulterated. Taking this average as a basis it shows that out of 29,200 milkings delivered during the year there would be 4434 defective samples, of which seven or eight only would be detected. This, I think, is sufficient to prove the futility of the working of the Act under the present system. As to the amount

of adulteration this depends entirely on the elasticity of the vendor's conscience which is governed by fear, not principle. I have known milk to be impoverished to the extent of 32 per cent. of added water together with a large abstraction of fat, which practically amounts to robbing the milk of one-third of its natural constituents.

How to combat this condition of things seems to me possible by enlisting the services of medical men to act in conjunction with the police. The man of medicine has to order milk diet oftener than any other article of food, and to him it is all-important in the conduct of his practice to see that those stricken with disease as well as the helpless infant are supplied with milk of absolute purity. However it is to be feared that the medical attendant too often rests satisfied with ordering his patient milk diet and with instructing the child's nurse to feed her little charge on half milk and half water, little thinking that his instructions are calculated to supply the child with a mixture of two of milk and three parts of water, with the result that the should-be-growing child makes little if any progress and too often wastes into a shadow, a condition to be followed by far-reaching and lasting ill-effects. The very foundation of the child's life is thus undermined when spared from extinction. Then taking for granted that the added water used in carrying out the adulteration is pure, the effects of impoverishing milk without rendering it impure are sufficiently serious to demand greater attention than it has hitherto received; how much more serious is the adulteration with water of doubtful quality and too often of a filthy character, taken, it may be, from a ditch or some such impure source.

In order to deal effectually with this vital question I venture to suggest that every medical man should provide himself with a lactometer and graduated glass vessel, the use of which would enable him to form a fairly accurate opinion as to the quality of the milk supplied to his patients. The ingenuity of the instrument-maker could certainly be depended upon to produce the necessary instruments of dimensions which would not be of the slightest encumbrance or inconvenience to the practitioner who should consider the lactometer as essential in the pursuit of his profession as the stethoscope or the thermometer is at present. In addition to the medical men, the services of nurses should also be enlisted. They could readily learn the use of the lactometer and would be in a position to make frequent tests of the milk supplied to their patients, and upon finding any defective supply should report the same to the medical attendant, who would communicate with the police, giving the address of the people supplied, together with the name of the milkman and the usual time of his delivering the milk. Having done so the further conduct of the case would be left to the police who should take the necessary steps to intercept the vendor on his next round and to procure samples. And in connexion with that part of the procedure I would advocate the taking of four samples, one each for the vendor, the analyst, and the police, the fourth to be roughly tested at the police station in the presence of an authorised person, and if found wanting the analyst should be supplied with a sample, but if found not to be adulterated the matter would end there and the expense of full analysis would be avoided, which is a serious item under the present system. It works out thus: 100 samples analysed at 10*s.* 6*d.* per sample amounts to 50 guineas, resulting in finding an average of 15 adulterated samples which lead to conviction and the infliction of a fine of 30*s.* at an average, including costs, per sample, or a total of £22 10*s.* for the 15 adulterated samples, leaving a deficit of £30 against the cost of analysis. These items alone, irrespectively of other expenditures in connexion with the detection of adulterated milk, are sufficient to prove that the present system is too expensive to be effective.

Whilst advocating the services of nurses in this matter I overlooked the exceptional opportunities which district nurses would have of rendering help, whose duty it is to look after the poor, these latter suffering more than any other class from the fraudulent milk vendor who feels secure in exercising his illegal devices on the little messenger who is sent for a pennyworth of milk. So great are the possibilities of assistance rendered by nurses in such cases that the use of the lactometer should be a part of their training and in cases where their knowledge leads to the detection and conviction of milk adulterators they should be entitled to a notification fee which should be enforced as part of the costs and borne by the convicted person. I feel convinced that the above system of notification, supplemented in case of conviction by a minimum fine of £2 with all costs for the first offence, £5 for the second, with imprisonment without option for the third and subsequent offences, would have a deterrent effect and in the near future bring about a wholesome condition of things.

I am, Sirs, yours faithfully,

T. D. HARRIES, F.R.C.S. Eng., M.R.C.P. Lond.

Aberystwyth, Sept. 20th, 1903.

*** In regard to Mr. Harries's estimate as to the cost of analysis against the amount of fines secured, we may point out that although 10*s.* 6*d.* is often paid for milk analysis under the Sale of Food and Drugs Act it is by no means the rule. Some public analysts agree to examine at least 1000 mixed samples per annum, for which they receive £250 remuneration. Again, milk is often made the exception to the 10*s.* 6*d.* scale, 5*s.* being charged instead. This fact materially affects the figures quoted by Mr. Harries, for at the 5*s.* rate per sample there would be practically no deficit in regard to fines in the example he gives as against the cost of analysis.—ED. L.

THE CAUSATION OF THE PULMONARY SYSTOLIC MURMUR.

To the Editors of THE LANCET.

SIRS,—Dr. W. L. Ascherson in THE LANCET of Sept. 26th, p. 874, has given an interesting and valuable summary of several of the views held as to the causation of the pulmonary systolic murmur, but he has omitted reference to one that always seems to me to be amongst the most worthy of notice. I refer to the theory of Dr. Foxwell which attributes the pulmonary systolic murmur to dilatation of the right ventricle, mainly in the upward direction, and to the changes in position and shape of the pulmonary artery which follow this dilatation of the ventricle. With this explanation of the presence of a pulmonary systolic murmur in one's mind it is interesting to observe that the large heart present in Dr. Ascherson's case gave rise to "dulness in the first and second spaces," and cardiac dulness in this region, it is scarcely necessary to remark, is due to upward dilatation of the right ventricle. The not infrequent presence of a pulmonary systolic murmur in cases in which there is no anæmia has perhaps hardly attracted the attention which it deserves. Amongst the few who comment upon it Sir William H. Broadbent has noticed a pulmonary systolic murmur in healthy young men some weeks after return to England from Alpine climbing, and in this connexion it may be mentioned that I have known of a case where a medical man was so distressed by the persistence of the same murmur after having fatigued himself on a cycling tour that he consulted a London physician upon the condition of his heart. Dr. Graham Steell remarks on the frequency of a pulmonary systolic murmur in the cardiac failure of chronic alcoholism and, it is interesting to note, adds that "a systolic murmur, generally a slight one, may be present over the aortic area."[1] "A systolic murmur in all areas" is an expression frequently used by Dr. Steell when describing the abnormal sounds heard over the dilated hearts of the subjects of chronic alcoholism. It is possible, however, that the murmur heard over the aortic area in some of these cases may be considered to have been a conducted pulmonary murmur. Not long ago I listened to the heart of the patient of a medical friend where dyspnœa of rapid onset had followed soon after an operation. A basic systolic murmur thought to be due to disease of the aortic valve had been heard, but after listening to the heart I thought the point of greatest intensity was over the pulmonary area and suggested that the dyspnœa might be due to strain upon the right side of the heart associated with thrombosis of the smaller divisions of the pulmonary artery. This may appear to have been rather an improbable diagnosis, but thrombosis of many of the smaller divisions of the pulmonary artery within the lung occurs not so very uncommonly and a day later a post-mortem examination enabled us to prove the presence of thrombi of this nature. All the valves of the heart, as well as the aorta, were healthy and there was nothing to account for the loud basic systolic murmur which had been present but dilatation of the right side of the heart. At least one other similarly

[1] Medical Chronicle, vol. xviii., p. 11.

well-marked illustration could be given of dyspnœa associated with a murmur thought to be aortic, where after death the disease was found to be in the cardiac wall and the pulmonary and aortic valves, as well as the vessel walls, were quite healthy. As examples of other instances where the pulmonary systolic murmur is probably due to dilatation of the right side of the heart its presence in acute rheumatism and chorea may be mentioned. In these diseases the murmur is common enough and is generally attributed to anæmia. But no anæmia worthy of the name may be associated with the pulmonary murmur and it seems reasonable to attribute its presence in such cases to dilatation of the right side of the heart due to poisoning of the cardiac muscle by rheumatic micro-organisms or their toxins.

I am, Sirs, your faithfully,

Sept. 27th, 1903. THEODORE FISHER.

TYPHOID FEVER IN ARMIES.

To the Editors of THE LANCET.

SIRS,—In a leading article in THE LANCET of Sept. 26th, p. 893, continuing the discussion of the subject of my letter to the *Times* on the Prevention of Typhoid Fever in Armies which you had previously considered in THE LANCET of Sept. 19th, p. 831, you resume the consideration of the technical aspects of the scheme I have proposed. Both the question of sterilisation of infected excreta and the sanitary control of camps, which I understand you to infer are not provided for in my scheme, are both fully considered therein. The application of inoculation has also an important part to play, though dealing only with the limitation of one of the diseases this scheme is designed to prevent. Limits of space prevent me detailing at length the provisions of this scheme directed to the creation, organisation, and training in technique within every unit of the army of two special "sections," a "water section" and a "pioneer section"—the former charged with the control of all the possible fluid avenues of typhoid fever, the latter charged with the control of the remaining avenues by air, dust, or direct contagion, and therefore having control of camp cleanliness, soil, latrines, sterilisation of infected excreta, bedding, tents, &c., of the infected and of those recently in contact with the infected. This scheme also comprises the education and training, by the new sanitary officers of the Royal Army Medical Corps, of all non-combatant officers in the same technique, that they may adequately control the proper discharge of the functions of these "section" men placed under their direct authority, the entire responsibility for the occurrence of typhoid fever, cholera, and dysentery being placed upon these officers absolutely. This principle with that of the essential requiring the creation of sanitary officers to divisions have been practically conceded, it being now compulsory at Woolwich, Sandhurst, and the Staff College for all to attend lectures on sanitation.

The whole scheme, which is practically a continuous laboratory experiment, being the exclusion of definite bacilli from a definite area or society, is detailed at some length in the proceedings of the Medical Society of London and of the Royal United Service Institution, and elsewhere, though even on these occasions only the practical outlines have been suggested of a scheme which must ultimately depend for success (*a*) upon studied attention to detail, and (*b*) on the thorough training and complete interest of every officer of the army. This latter provision will tend to limit the instances in which any of the sanitary functions referred to above may be interrupted by the "exigencies of a campaign" to the same narrow limits that such exigencies may also interrupt the service of ammunition or artillery. It is quite true, as you state, Sirs, that "Dr. Canney's method of supplying a sterilised water to the army in the field if it be practicable should certainly play *a part* in any comprehensive scheme"; it is only "a part" of the much larger scheme I have proposed.

With regard to the consideration of the causation of typhoid fever in the volunteer camps of the United States Army, I have shown at the Medical Society of London that to attempt either in this instance or in that of Bloemfontein to discriminate between the various avenues of typhoid fever open to the camps was absolutely futile. In both cases every avenue was open and no sanitarian would venture to state that the bacillus might not be recovered from any piece of clothing or tent or from any part of the soil or from any bucket of water in these seething masses of infection. Such cases of chaos resulting from every sanitary law being absolutely disregarded have no interest for the sanitarian. These are not experiments and only crucial experiment can be accepted as evidence. I think, therefore, the conclusion you have drawn from such considerations should be waived or considered in association with instances in war and peace where something more in the nature of sanitary experiments was in force.

With your suggestion, Sirs, for the immediate creation of a committee associated with the Advisory Board for the working out of the details of a plan of sanitation suitable to abolish these evils in the army in war and in peace I am in entire accord. The continued terrible losses in India, South Africa, and elsewhere from causes we believe to be entirely preventable is a drain upon the country, a reflection on modern scientific work, and leaves the army in times of peace totally unacquainted with the methods and organisation that would be necessary in war and which would require some months to develop, leaving the army at the mercy, in the interval, of mathematically certain destructive agents.

I am, Sirs, yours faithfully,

Sept. 28th, 1903. H. E. LEIGH CANNEY, M.D. Lond.

*** For Dr. Leigh Canney's enthusiasm we have every respect but he does not do us the honour of reading very carefully what we say. Our leading articles are about typhoid fever in armies and not about his letter to the *Times*, though incidentally his letter furnished subject for considerable comment. We have expressly acquitted Dr. Canney of saying that his scheme is a panacea for typhoid fever in the army, so there is no need for him to plead the limits of our space as preventing him from unrolling his scheme. Besides the gist of his scheme has appeared in THE LANCET and we have given our readers an exact reference to the place of publication.—ED. L.

TRADE "TAXES" ON FOOD.

To the Editors of THE LANCET.

SIRS,—As far back as 1303, in the days of Edward I., the market middlemen (formerly known as "forestallers"), who now in 1903 still control our food-supplies, were then punished by banishment, forfeiture of goods, the pillory, fines, and imprisonment. Before a safe and sound state of affairs can be brought about in the British empire these laws and penalties must be revived or suitable restrictions re-enforced. In 1674 a special Act of Common Council states that "the (London) markets being intended for the benefit and advantage of housekeepers and others, who buy for their own use, to be spent in their own families, to provide for themselves in the morning at the best hand, and pay moderate rates for their provisions." This Act also enforced *bonâ fide* public auctions and proper weighing facilities within the market. In 1801 the Common Council of the City of London issued its famous report "as to the extravagant high price of every necessary article of human sustenance and food, which had become truly alarming," concluding with "in order to stop the nefarious practices of regrating and intercepting the supplies of provisions for the metropolis, we (the Common Council) are unanimously of opinion that such practices should be prohibited, the offenders heavily punished, and the contracts declared void." The majority of the nation is now greatly alarmed at proposed microscopic taxes on food. Yet the country calmly submits to avoidable but augmenting trade rings whose commercial combinations have cornered our entire fresh food-supplies during both peace and war. Tied bakers' shops run by millers, public-houses owned by brewers, an artificially limited supply of perishable meat, game, poultry, eggs, butter, margarine, fish, vegetables, fruit, &c., are all safely in the octopus grasp of the ubiquitous middlemen, who have illegally monopolised our fresh food markets, the joint property of the primary food producer and the consumer.

Free trade should mean free dealing between producer and consumer which, owing to the machinations of the middlemen, has been made practically impossible in the British empire. Wherefore, despite of free imports, the price of fresh food in England still compares most unfavourably with that of some other countries—notably Germany—where the trade rings are less powerful and less greedy, and where, although almost all home-grown foods and food imports are

taxed, yet the actual cost of food to the consumer is far less than in our own country. Our fresh food-supplies, if made "imperishable" (as I have so long persistently publicly advocated) by proper means of killing or collecting, preparing, dry cold-air storage, and distributing, would tend to defeat the middlemen's monopoly. Various kinds of fresh foods demand different but definite (artificial) dry cold-air temperatures for "imperishable" preservation. The majority of these animal and vegetable fresh foods, especially fish, are cheaper to produce, store, and distribute, besides being much more wholesome, nutritious, and palatable in the "imperishable" condition than in their present perishable forms, too often stale and sometimes even poisonous. Of course, in the event of war, then only "imperishable" fresh food supplies for the people, army military and mercantile marine can save the United Kingdom from starvation.

I am, Sirs, yours faithfully,

J. LAWRENCE HAMILTON, M.R.C.S. Eng.

Brighton, Sept. 28th.

Note.—Examples: (1) New Zealand mutton is delivered at the chief ports of the United Kingdom at less than 3*d.* per pound, for which in the same town the consumer is charged from 7*d.* to 1*s.* the pound by the local butcher. (2) Sprats are often sold in Billingsgate at the rate of about 19 pounds for one penny, for which the local London fishmonger or costermonger charges from 2*d.* to 3*d.* or more per pound.

As far back as 1303 a wise and just statute of Edward I. declared that "the forestaller" (now called middlemen's rings) "is an open oppressor of the poor and an enemy of the whole country." A Parliamentary return as to the prices paid to the primary fresh food producers and those charged to the consumers, would prove that the fresh food rings of market middlemen (who do not distribute the food) are a grave and growing danger and disaster to the trade, the progress, and the prosperity of the empire.—J. L. H.

FEVER AND CONVULSIONS DUE TO ASCARIDES.

To the Editors of THE LANCET.

SIRS,—*Apropos* of your annotation in THE LANCET of Sept. 26th, p. 898, headed as above, I beg to say that worm fever is a well-recognised malady in this district, at least among the poorer classes. I was rather doubtful at first, when a woman came and asked for some powders, saying that her child had worm fever, whether such a condition existed or not; but on going to the house and taking the temperature I found it to be 104° F., with the usual concomitants of fever, headache, thirst, &c. A couple of doses of santonin and calomel were followed by the discharge of several round worms and a rapid disappearance of the fever.

A few months ago I had a case of epileptiform convulsions in a child; I prescribed santonin and calomel. She also got rid of several round worms and has been since quite well. I have never been in a locality where one meets with so many cases of round worms. A sister of the last patient, her mother informed me, took three large ones from her mouth when suffering from a feverish attack. They had probably been driven upwards by "overcrowding," as the number she passed after a vermicide and purgative was simply immense. I may add that I have never come across a case of this fever or of convulsions in an adult, although several have consulted me to get freedom from these parasites. I suppose it is that the nervous systems and digestive tracts of children are more susceptible to irritation than those of grown-up people. If the suggestion of Dr. Wettendorff is a correct one—that the fever and convulsions depend on the absorption of toxins secreted by the worms—one would expect to find an occasional adult affected in these ways.

I am, Sirs, yours faithfully,

GEORGE TANDY WILKINSON, L.R.C.P. Edin., &c.

Lostwithiel, Sept. 28th, 1903.

SMALL-POX OR CRAW-CRAW.

To the Editors of THE LANCET.

SIRS,—May I call the attention of the readers of THE LANCET to the fact that craw-craw is being diagnosed as slight cases of small-pox? The first case which came under my notice was a man, aged 34 years, who had been suffering on and off from the papular form of craw-craw for some months. The irritation was chiefly confined to the pubes, abdomen, and chest, which was so itchy that it caused him to rub off the skin by scratching. The present attack was vesicular in character and his friends thinking that he was in a serious condition took him to the family medical attendant. He pronounced that it was probably small-pox and advised his removal to the hospital. His friends, not being satisfied, sought advice elsewhere and two other medical men concurred in the diagnosis, and yet the father of the patient was dissatisfied and asked the medical men at the hospital if it was usual for successive crops of vesicles to come out in cases of small-pox whilst others were dying away after scabbing and no pus being present. The medical men being thus challenged suggested that the assistance of the medical officer of the small-pox hospital should be obtained and they would abide by his opinion, which he ultimately gave as being a case of chicken-pox, and the patient was sent home.

I opened one of the most recent vesicles five days afterwards, made films, and therein found embryo nematodes. This case and other similar ones determined me to communicate with Dr. B. Anningson, medical officer of health of Cambridge, to obtain some blood films for me of any doubtful case of small-pox he might have and in response to my application through him I have received some from Dr. R. D. Smedley who has charge of the cases. On examining the films I again find the same nematode and the short history which he has kindly supplied of this particular case is similar to the former one.

I would suggest that in future medical practitioners should invariably make thorough blood examinations whenever skin lesions are present, as an error of confusing the two diseases may lead to serious results. I hope to be able to furnish you with an illustrated article on this subject before long.

I am, Sirs, yours faithfully,

Birmingham, Sept. 19th, 1903. J. DENCER WHITTLES.

*** This observation made by Mr. Dencer Whittles concerning the presence of embryo nematodes in a papulo-pustular eruption, which had been diagnosed as due to small-pox, is most interesting and may prove to be of the highest importance. Unfortunately the term "craw-craw" has a very elastic significance, the natives of the West African Coast applying the term to almost every papular or pustular eruption associated with itching. Scabies is the ailment most usually termed craw-craw and this is the first time (as far as we know) that small-pox has been brought into the category of mistaken diagnoses. A filariform embryo has been found in the papulo-pustular eruptions of craw-craw, but whether it is associated with the etiology of the pustule, or is merely present in the fluid obtained from the pustule in consequence of a general blood-infection, has not yet been settled.—ED. L.

THE DANGERS OF VAGINAL DOUCHING.

To the Editors of THE LANCET.

SIRS,—In the medical press some attention has recently been called to grave symptoms supervening upon the use of the vaginal douche. The practice has become so common that I feel that it is desirable that every medical man who has seen such troubles should record his experiences as a protest against the indiscriminate employment of the ball syringe. Some years ago I recorded the first of the three following cases in the *Guy's Hospital Gazette*.

CASE I.—The patient was a woman, aged 30 years. On the eighth day after delivery of her fourth child and during a normal puerperium I was suddenly summoned. I found the woman shivering and collapsed, with a pinched, frightened expression and crying out with a terrible pain in her abdomen and back. The temperature was raised to 101° F. In 20 minutes the rigor ceased. The temperature was then 103. The face was flushed and the pain had diminished. It appeared that the nurse had inserted the vaginal tube which the patient said she "felt to be in the wrong place," and at the first squirt she had fallen back with an agonising pain in the abdomen and a feeling of impending death. She had vomited. Blood followed the syringing. The os uteri was very patulous. The abdomen was very distended and exquisitely tender. The temperature rose to 104° in the

afternoon. Gradually the symptoms of peritonism passed away and in three days she was well again.

CASE 2.—The patient was a woman, aged 34 years, whom I saw two years ago. She was parous but was very desirous to avoid pregnancy again. The catamenia having been regular for some months failed to appear at the expected time. A few days having elapsed she one morning proceeded to syringe herself with hot water, passing the *rectal* nozzle as far up as possible. She believed it entered her womb. At the first squirt she was seized with frightful pain in the abdomen, was sick, faint, and collapsed, so that a neighbour thought she was dying. Two hours later I found her lying on her back in a state of collapse, groaning with pain in the abdomen which was distended and most acutely tender. The temperature was 102° F. She soon reacted to stimulants. The uterus was small and there were no signs of pregnancy. She appeared to be entering upon a dangerous attack of peritonitis; on the third day she was, however, practically well.

CASE 3.—A woman, aged 36 years, had had one child, now two years old. She was very anxious to avoid a second pregnancy. Five weeks before I was called to her, after coitus, she injected cold water. She was seized at once with violent pain in the "stomach" and collapsed, so that her husband had been on the point of setting out for me. With the help of brandy in two hours she rallied. Ever since she had had pain in the abdomen. Deep in the left side of the abdomen was a small, very tender tumour. The uterus was anteverted, non-pregnant, and unconnected with the tumour. She complained of frequent attacks of cramping pain in the left side in the neighbourhood of the tumour. A few weeks later she had no more cramp but still said that she had a "lump in the stomach." Two months later she was quite well.

The clinical picture in all these cases is that of a severe shock inflicted on the peritoneum and is exactly comparable to the symptoms of a ruptured viscus, save that there was a rapid rise of temperature. It is very noticeable that in all my cases the accident happened at the commencement of the injection. I suggest that the uterus was taken unawares and allowed the fluid to pass into the Fallopian tubes and so by the ostia into the abdominal cavity. In my last two cases the rigor if it occurred was not a striking feature. I cannot accept the explanation offered for these cases that toxins entered through an abrasion of the surface and caused a rise of temperature. There are very unlikely to be virulent organisms living on the vaginal mucous membrane of non-puerperal women. The whole question is an obscure but very important one. Pathologists might throw much light on the subject by making experiments with Higginson's syringe on the cadaver with a view to discovering whether it is possible to force water from the ordinary vulcanite nozzle or the rectal tube into the abdomen. Abdomens are opened every day and fluids are poured into them, and trocars are driven into them, yet no serious reaction occurs. Why should a few drachms of a weak antiseptic or plain water pumped through the Fallopian tubes produce such grave symptoms? Although quite unable to suggest an alternative I very much doubt whether this, the usual explanation, is competent to account for the severity and suddenness characteristic of the condition.—I am, Sirs, yours faithfully,

VAUGHAN PENDRED, M.D. Durh., F.R.C.S. Eng.

Sept. 26th, 1903.

MEDICAL DOCTRINES OF HEREDITY.

To the Editors of THE LANCET.

SIRS,—Dr. Reid appears to misunderstand my position somewhat. He has put forward a certain argument which he told us was "the most convincing one against the popular view" and which has been repeated again and again in letters to THE LANCET. I have endeavoured to point out a fallacy and I believe Dr. Reid will agree that no opinion, however well founded, should be supported by unsound reasoning. He finds fault with me because I only contend that degeneracy from acquired characteristics *may* occur. I must remind him that I am replying to an argument by which he tries to prove, on theoretical grounds alone, that it is a physical impossibility. My belief is that it is a question to be decided by evidence, and evidence only.

I do not argue that degeneracy is a powerful factor in evolution, or rather in retarding evolution; it is sufficient for my purpose to prove the possibility of its existence. The fundamental idea of my letters that one tendency (degeneracy) may be more than counterbalanced by a stronger tendency (elimination of the unfit) is an exceedingly simple one, and Dr. Reid's elaborate manipulation of figures will never prove that a strong force cannot overcome a weak one. I am sorry his argument about antelopes is quite unintelligible to me. He says, "A very minute degree of degeneracy of offspring would cause ultimate extinction of the race—how minute may be realised when we consider the slowness of the evolution of a species the individuals of which, as a rule, are not much exposed to deteriorating agencies but die violent deaths." But if a species is not much exposed to deteriorating agencies the resulting degeneracy would be correspondingly small, and slowness of evolution suggests the presence rather than the absence of a retarding factor such as degeneracy.

Dr. Reid also says that the English "have been afflicted by measles probably for thousands of years." It may be so, but it is said that "its separate identity was first shadowed forth by Forestus (1563), but it is to Sydenham (1676) that we owe the full differential diagnosis between measles and small-pox."[1] It is difficult to believe therefore that his statement has any satisfactory evidence for it. It may be that infectious diseases evolve and die out like higher species of animals, only with far greater rapidity. Dr. Reid says I live "in the futile world of 'maybe.'" I live in a world where many things may be. It is better than one of dogmatism about matters of which I know nothing.

I am, Sirs, yours faithfully,

Sept. 26th, 1903. C. E. SCUDAMORE.

To the Editors of THE LANCET.

SIRS,—By an inexcusably clumsy expression in my last letter I made it appear as if I took credit for the first discovery of Galton's law of regression towards mediocrity. As you are aware, I tried too late to rectify the blunder and Dr. Niven is entitled to hold me up to derision in consequence. What I meant to say was that it is many years since I first drew attention to the bearing of this law on the inheritance of insanity, &c. I will not follow Dr. Niven in his wanderings from the point at issue; and as to his confession of inability to grasp my reasoning I am tempted to quote Dr. Johnson's retort on a similar occasion. But it is necessary to draw attention to a controversial artifice which is not, indeed, rare, but which I have never known to be employed so persistently or with such indifference to the protests of the other side as it is employed by Dr. Reid and Dr. Niven. I refer to their habit of fathering upon their opponents opinions which these opponents do not hold and then gaining a cheap triumph by refuting them. Dr. Wiglesworth has at length wrung a tardy apology from Dr. Niven for one example of this stratagem, but Dr. Reid is more recalcitrant. In one letter[2] he attributed to me without a shadow of justification an assertion which I had never made and which I immediately repudiated. Any ordinary disputant would have expressed regret. Not so Dr. Reid. In one breath he calls my repudiation a petty personality and a verbal quibble; in the next he says I am quite right; and then he is positively aggrieved because I repudiate a doctrine which he has gratuitously fathered upon me, and wants to know what business I have to interfere in a discussion with him unless I hold a doctrine which it suits him that I should hold! Knowing by previous experience this practice of Dr. Reid and his "school" I warned your readers in my last letter against it, and sure enough in the very same issue Dr. Reid attributes to me one of the very doctrines which I gave as examples of the sort of absurdity that they might find fathered upon me. The oddest part of the whole affair is that Dr. Niven sees nothing objectionable in this procedure. "If I did, what matter?" says he. Well, to me it matters so much that I withdraw from a discussion conducted by such methods, and I ask what is to be thought of a cause that needs such expedients for its support?

To the question of "M.D." I fear that no satisfactory answer can be given. I know of no book on the subject of heredity with special reference to medical doctrines. The bearing of heredity upon insanity I have been in the habit of dealing with pretty fully in my lectures on this subject and no doubt my colleagues who lecture on the same subject have

[1] Gibson's Medicine, vol. i., p. 163.
[2] THE LANCET, August 29th, p. 630.

done the same. A very brief and bald *résumé* of this aspect of heredity is given in my "Text-book of Insanity" and a rather fuller synopsis in the article on Heredity in Hack Tuke's "Dictionary of Psychological Medicine." General biology, with special stress laid upon heredity and reproduction, should no doubt be taught among the "institutes of medicine," but in the overloaded curriculum it would be difficult to find room for it.

On Dr. Wiglesworth's suggestion of a State laboratory for the investigation of scientific problems I look with no favour. Our experience of Government offices is that what is done by them is done badly—is certainly done less well than by private endeavour. The primary business of the State is to prepare for and to conduct its own defence and it is not likely to conduct other affairs more competently than it conducts these. How efficient it is in these primary and essential matters the War Commission shows.

I am, Sirs, yours faithfully,

Sept. 26th, 1903. CHARLES MERCIER.

To the Editors of THE LANCET.

SIRS,—If "M.D." has not accepted the hint contained in Dr. C. R. Niven's letter in THE LANCET of Sept. 26th, p. 903, permit me to suggest that he will find exactly what he wants in "Alcoholism: a Study in Heredity" (Fisher Unwin, 1901). The title is perhaps misleading, but "M.D." will find that the first nine chapters explain the subject in very clear language. It is necessary to point out that the subject of "heredity with special reference to medical doctrines" was practically created by the author of the book named and that, therefore, any study of the subject must begin with a perusal of his works. "M.D. Edin." will find in the same book that the definition he desired was given long ago, and he will be able to judge from a perusal of the work whether Dr. C. Mercier's letters are to be taken as serious contributions to the subject or are to be regarded in the same light as the opposition offered in your correspondence columns, Sirs, to the doctrines of Lister in the early "seventies." I am glad to find that Dr. G. R. Leighton supports my suggestion,[1] that teaching upon this subject is needed in the medical curriculum. Dr. J. Wiglesworth is welcome to his national laboratory for the experimental study of heredity, but others will prefer to raise their eyes from mere microscopic and laboratory research to a broad study of the process and results of the great experiment which nature has been carrying on through countless ages in man and the whole animal creation. I venture to think that Dr. Wiglesworth would find this the shorter and surer path to truth in this case.

I am, Sirs, yours faithfully,

Florence, Italy, Sept. 28th, 1903. LAING GORDON.

THE VENTILATION OF DWELLINGS.

To the Editors of THE LANCET.

SIRS,—In THE LANCET of Sept. 26th appears a report upon the International Congress of Hygiene and Demography by your Special Sanitary Commissioner and under the head of the Third Section on p. 915 of your journal Mr. Adolphe Smith is reported to have said: "Dr. J. F. J. Sykes has given evidence that in England the authorities proclaimed their failure to solve the problem. They insisted on through ventilation. In other words the rooms were to be purified occasionally by creating such a draught as to render them uninhabitable. This was a clear indication that when inhabited they were insufficiently ventilated."

Permit me, in the first place, to deny that I have given any evidence that in England the authorities have proclaimed their failure to solve the problem of domestic ventilation. In the second place, permit me to assert that in England we have come nearest of any nation to the purification of the air of our dwelling rooms. I make this assertion with the greatest confidence in the support of my colleagues, because English hygienists have realised that the purification of the air of dwelling rooms demands two processes, the one continuous and the other intermittent—namely, ventilation and perflation. Ventilation demands the continuous flow of air through a habitable room in such manner that it may continue to be ventilated and that the occupants may not feel any appreciable draught. Perflation requires to be of such a forcible kind that the room cannot be occupied with comfort during the period required by the process. The former supplies air for the immediate and continuous requirements of the occupants of the room, the latter forcibly blows away the accumulated products of respiration, combustion, and illumination that deposit themselves upon the various surfaces and in the numerous interstices of the contents of the room. Perflation is the object of the peculiarly English demand that houses, dwellings, and inhabited rooms should be so constructed as to be capable of "through ventilation." It is the object of the English housewife when she throws all doors and windows open for the purpose of airing bedrooms and other rooms. It is the object aimed at by hygienists who know how persistently the organic products of respiration cling to the surfaces of the pictures and furniture of an inhabited room. And its absence explains the well-known persistent "odor humanus" of the one-room dwelling of tenement houses where the daily perflation cannot be carried on on account of the *continuous* occupation of the one and only room. I am, Sirs, yours faithfully,

Camden-square, N.W., Sept. 29th, 1903. JOHN F. J. SYKES.

[1] THE LANCET, Sept. 19th, p. 843.

PUBLIC CONVENIENCES.

To the Editors of THE LANCET.

SIRS,—London is generally supposed to be ahead of other capitals in sanitary matters and the provision of public "lavatories" (urinals and water-closets) has of late years made very satisfactory advance, the underground refuges in particular leaving little to be desired as regards fittings and cleanliness. Yet in this vast city there are many regions where the wayfarer may traverse considerable distances without finding places of relief for the over-distended bladder and if they exist they are too often hidden away in obscure corners with no indication of their whereabouts. English prudishness prides itself on strict reticence on such matters, with the result that no indications are to be seen in our main thoroughfares of conveniences placed a few yards away in a side street. These remarks are based on a personal experience, probably not uncommon with sexagenarians like myself. Having to traverse Mayfair from Piccadilly to Oxford-street I could not descry a single refuge in that aristocratic quarter, but I hoped to survive until reaching the more democratic district of Marylebone, north of Oxford-street. From time immemorial there has been a simple yet sufficient urinal in Marylebone-lane opposite the Court House (where, I believe, the medical officer of health has his office), but to my disappointment this was closed, whether permanently or temporarily I know not. I remembered, however, that formerly there was another public convenience at the High-street end of the lane and thitherwards hastened my steps, only to find that that had disappeared—at any rate, I could not find it. Fortunately, the Medical Society's house in Chandos-street was within reasonable distance, and thankful, indeed, was I to be a Fellow and enjoy the privilege of access to the lavatory. What I want to urge, however, is the desirability, in the interests of public health, of these indispensable institutions being so placed as to be readily found, or if hidden away that there should be some indication (on lamp-posts or otherwise) of their situation. A direction plate labeled "Gentlemen" or "Ladies," as the case may be, need not shock the most fastidious. If I remember rightly a green pane (without inscription) is inserted in the street-lamps of Edinburgh or Glasgow to denote the vicinity of one of these refuges, and some similar device might surely be employed with advantage in London. Some enterprising publisher might make money by bringing out a pocket-map of London with these conveniences marked. At any rate, it would be patronised by, Yours faithfully,

Sept. 28th, 1903. SEXAGENARIAN.

LECTURES ON BACTERIOLOGY AT PLYMOUTH.—A course of lectures on bacteriology is to be given under the curriculum of the Plymouth education authority at the School of Science and Technology, Plymouth. Laboratory accommodation for practical work can be obtained by arrangement with the secretary of the South Devon and East Cornwall Hospital, Plymouth.

THE BATTLE OF THE CLUBS.

(FROM A CORRESPONDENT.)

A SERIOUS DISPUTE AT SHIPLEY.

CONSIDERING the important position contract medical practice holds in the medical mind at present it may not be amiss to give a short account of the position of affairs in Shipley as a climax has now been reached. All the medical men in Shipley, with the exception of one, are medical officers to the Oddfellows and any Oddfellow who is in the medical club has had the right to select any one of these as his medical attendant for 12 months. The terms were 4*s.* per head per annum for all attendance, together with a proportion of the levy fee for initiation certificates which amounted to less than 1*s.* per initiation. The first note of discord arose in September, 1901, when the medical men were asked to grant initiation certificates for females at the same rate. Several of them thought that it further indicated the intention to form female medical clubs, consequently they agreed to meet to discuss club practice in general. It was decided to take no steps until the annual circular was sent to the medical men for signing on for one year, when a note was sent to the secretary of the Oddfellows in which the following terms were asked: (1) the fee for certificate for initiation of females to be 2*s.* 6*d.*; (2) the fee for attendance on males to be 5*s.* per head per annum: (3) major operations to be charged at the same rate as the board of guardians' scale; (4) no females or juveniles to be accepted as club patients; and (5) no adults with weekly earnings of over 35*s.* to be admitted.

At the request of the Oddfellows the medical men agreed to meet a deputation from them to discuss the new rules and at this meeting the rules already submitted were modified thus—viz., that the fee should be 5*s.* per head per annum with no responsibility for accidents or 6*s.* with full responsibility in case of accident. The wage limit was dropped. On Dec. 12th the medical men were notified that the modified rules could not be entertained. Ultimately after another meeting with the deputation the Oddfellows agreed to pay 5*s.* per head and freed the medical men from attendance on accidents except the emergency attendance, and in case of accident the patient had to go to hospital or else to become a private patient. The initiation fee for certificates for females was also fixed at 2*s.* 6*d.* Now that terms were agreed on it became necessary to discuss the conduct of practice relative to clubs and after meeting the deputation about the end of January, 1902, it was mutually decided that each member should have a card with his name, address, selected medical officer's name, and the name of the lodge printed thereon. On the back of the card were printed the hours and other conditions of practice, including the following rule—viz: The medical man reserved the right to refuse any member who was put on his list. Things went on well enough till Oct. 7th, 1902, when a notice was sent to the medical men by the Oddfellows giving them a year's notice from Jan. 1st, 1903. Apparently the bone of contention was the rule about the medical men reserving the right to refuse any member. About the end of the month the medical men again met the deputation and as the rule objected to seemed rather arbitrary they offered the following rider—viz.: If the rule be found to be a hardship to any member that the case be brought before the medical men by the district officers.

Nothing further was heard until July 6th, 1903, when new conditions were sent to the medical men by the Oddfellows in which they sought to establish female medical clubs at 5*s.* per head and to refuse the rule and rider regarding the right to refuse any member. The medical men replied that they would not under any conditions accept female clubs but would further modify the rule objected to by adding that it had no reference to a wage limit.

In September, 1903, the medical men were notified that their terms were refused but that the chance of accepting the terms of the Oddfellows was still open to them. The medical men replied that unless female clubs were abolished they would not discuss the matter further. Consequently their services will terminate at the end of the year. It is understood that it is the intention of the Oddfellows to bring one or two men into the district at a fixed salary and to allow private practice.

This is practically a summary of what has happened. There is no need to go into the details of the misrepresentations that have been made to the men by the district officers or of their never having given the medical men the chance to meet the men in spite of repeated requests. Any medical man is advised to apply to Dr. Eames, the secretary of the Shipley Medical Union, before accepting any post advertised by the Shipley Oddfellows.

WALES AND WESTERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENTS.)

Typhoid Fever at Merthyr Tydvil.

Merthyr Tydvil, where there is a population consisting largely of working people of about 70,000 persons, is just now experiencing a severe outbreak of typhoid fever which has features of an unusual character. For the past ten years there has been a yearly average of 147 cases of typhoid fever in the town and an average death-rate of 0·27 per 1000 from that cause. During the first eight months of this year an average of five cases was reported each month, but in the first week of September 14 cases occurred, in the second week 18 cases, in the third week 56 cases, and in the week ending Sept. 26th there were 38 cases reported, giving a total for the month of 126 cases. Such a sudden outburst could only be attributed to a common source and in a special report to the district council the medical officer of health (Mr. D. J. Thomas) discusses the probable origin. He states that the outbreak is of too extensive a character to be accounted for by insanitary conditions and that as a fact no gross sanitary defects were found on the premises occupied by any of the persons affected. After excluding water- and milk-supplies as possible sources of the outbreak Mr. Thomas deals with shell-fish. He found that nearly 90 per cent. of the patients attacked had recently partaken of cockles or mussels and that nearly all had purchased them from a market stall kept by the wife of a railway guard. A consignment of the shell-fish was washed by the woman and her husband on August 14th and most of the infected persons made their purchases on the day following. It is of interest to notice here that in the case of 53 of the patients the initial symptoms appeared between August 28th and 31st. On August 21st the husband of the stall-keeper was confined to bed, having had diarrhœa for eight or nine days previously, and his illness developed into a typical attack of typhoid fever from which he died on Sept. 25th. All the cases have given a positive Widal reaction, though the type of the disease is exceptionally mild, a large proportion of the patients exhibiting hardly any typhoidal symptoms. The sex distribution of those attacked is about equal and the incidence of the disease is heaviest between the ages of 10 and 15 years, though no age period is quite exempt. More than half of the patients have been removed to the isolation hospital.

The Bristol Hospitals.

The managers of both the Bristol hospitals are deploring the fact that although the number of patients treated in their wards is constantly increasing there is no corresponding increase in the number and amount of subscriptions received. At the last half-yearly meeting of the governors of the Royal Infirmary it was stated that for several years past the expenditure had exceeded the income, so that by the end of the present year there would probably be a total deficit of nearly £16,000. The most noticeable feature in the half-yearly report of the General Hospital is the falling-off in the sums received from donations and legacies, amounting altogether to £5187 while ordinary subscriptions and the collections in places of worship brought in about the same amount as in the corresponding period of the previous year.

British Dental Association.

In his address delivered at Carmarthen on Sept. 24th as president of the South Wales and Monmouthshire branch of the British Dental Association, Mr. E. James expressed the opinion that more effectual steps should be taken to check unqualified dental practice by persons who performed dental operations probably in a very imperfect manner and often to the injury of their patients.

University College, Cardiff.

Dr. David Hepburn, F.R.S. Edin., has been elected professor of anatomy at the University College, Cardiff, in succession to Dr. A. F. Dixon who is now professor of anatomy at Trinity College, Dublin. During the past nine

years Dr. Hepburn has been lecturer on regional anatomy at the University of Edinburgh.

Glamorganshire County Asylum.

The resignation is announced of Dr. H. T. Pringle, the medical superintendent of the Glamorganshire County Asylum at Bridgend. He will probably give up office at the end of the present year. The first county asylum was built in 1864 and two years later Dr. Pringle was appointed assistant medical officer, so that he has been connected with the institution almost since its establishment. The visiting committee at a recent meeting passed a resolution recording its high appreciation of the skill and ability which Dr. Pringle had devoted to the discharge of his arduous and trying duties.

Proposed Lunatic Asylum for Devonport.

The agreement existing between the Devon county council and the Devonport borough council, whereby the former authority receives the lunatic patients from Devonport at the Devon County Asylum, will cease in about three years, and as the county council cannot longer continue this arrangement the local authorities will have to provide accommodation for about 140 patients. The Devonport council has unsuccessfully endeavoured to come to terms with other authorities for the reception of these patients. Consequently the committee appointed to consider the subject has arrived at the conclusion that it is essential for the borough to build an asylum, and it recommends, therefore, that an institution should be provided for the accommodation of 250 patients and that a site of 50 acres should be purchased for its erection. The total cost of site and buildings is estimated at £50,000.

Sept. 28th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

Drumconrath Dispensary.

THE vacancy which arose in Drumconrath Dispensary through the resignation of the late Dr. J. Jones has never been filled, as the guardians would not increase the old salary and the medical men declined to compete unless the minimum of £200 per annum was offered, as agreed upon by the Irish Medical Association. A locum-tenent at £4 4*s.* per week is doing the duty. The Local Government Board proposes, as a way out of the difficulty, to amalgamate Drumconrath with Collon district (Mr. More Caraher's) and to give to Dunleer district portions of Collon. The Drumconrath guardians, in the interest of the poor, declined at their meeting on Sept. 22nd to make these changes on the ground that either of the re-arranged districts would be too large for one medical officer to work properly. A much better plan would be for the Local Government Board to advise the guardians to give the proper salary—£200—and the office would be at once filled, but it seems quite unable to pursue a consistent policy.

The Belfast Water-supply and Typhoid Fever.

The chairman of the Belfast water commissioners at their fortnightly meeting held on Sept. 24th criticised Professor J. Lorrain Smith's recent report dealing with the water-supply of the city.[1] He first corrected an error in Professor Smith's report in which it is stated that the Stoneyford water was brought into the city during the end of 1888 (the inference being drawn that this was accountable for the sudden rise in the mortality from typhoid fever in the year 1889), while as a matter of fact it was not until May, 1890, that this water was introduced, so that this sudden rise in the typhoid fever death-rate cannot be charged against the Stoneyford water. The chairman of the water commissioners said that the tables given by Professor Smith in his report show a sudden rise in the typhoid fever death-rate in 1897–98, but the fact is suppressed that in 1897 the city of Belfast was largely extended, outlying places (Ligoniel, Greencastle, &c.) being brought in owing to their insanitary condition. Further, the Notification of Infectious Diseases Act was introduced, but no connexion is traced between these facts and the sudden rise in the typhoid fever death-rate. At Ligoniel and Ballysillan there were severe outbreaks of typhoid fever and in a sample of water from the street fountains at Ligoniel (not supplied by the water commissioners) Professor Smith reported to the Belfast board of guardians that he had isolated the typhoid bacillus. He has never been able to do this in the case of the Belfast water, though he has spent years in searching for it. Again, if the Stoneyford water be the cause of the existence of typhoid fever in Belfast, how is it that it conveys infection to one district of the city and not equally so to the other districts where the water is used? It is used in other districts than No. 10 where the number of cases are not above the average; indeed, the village of Dunmurry is supplied from the Stoneyford mains and yet the cases of typhoid fever are no more than they were before the introduction of the water, and all the cases occurring, the chairman of the water commissioners said, have been traced to causes other than the water-supply—that is, infected milk and insanitary conditions. Every precaution, said the chairman, has been taken, by diverting doubtful water, long storage, careful filtration, and by medical inspection of houses in the district, to safeguard the water-supply, and it is a remarkable fact that though the suspected water, which is turned down the natural water courses, is used by the residents of Stoneyford village and its vicinity no cases of typhoid fever have occurred—that is, surely, if people below the catchment area use suspected water, without storage or filtration, without typhoid fever arising, the people of Belfast who obtain pure water, stored and filtered, must be free from danger. The commissioners have taken, and are still taking, every precaution to make their catchment area at Stoneyford free from all risk, yet these facts are dealt with in a very cursory way by Professor Smith. The chairman further said that while the commissioners were taking every possible care to prevent contamination of the water-supply during the occurrence of typhoid fever in a farmhouse in the catchment area the milk and butter from this farmstead were being sold in Belfast in the very district where typhoid fever had been most prevalent, a matter not referred to by Professor Smith in his report, though he admits that milk forms a much more effective carrier of typhoid fever germs than does water, and though this case was brought under his notice when he visited the farmhouse in company with members of the health committee and their officials. This condition of matters applies largely to milk-vendors within the city of Belfast, and in a late visitation in a row of 12 workers' houses in No. 10 district typhoid fever occurred in eight of these houses. It was found on investigation that the occupants of these eight houses got their milk-supply from a particular dairy and the remaining four who got theirs from a different source were free from disease. In Professor Smith's voluminous report the chairman said that the milk-supply is thought only worthy of a notice contained in less than a dozen lines. Finally, the chairman drew attention to the generally insanitary conditions that exist in Belfast, the 10,000 houses with privies and ashpits, the defective drains, and the houses built on ashpit and privy refuse, and according to the chairman Professor Smith fails to see any direct connexion between this very state of affairs and the disease prevalent in the city, a position which the chairman thinks untenable.

The Marriage of Nurses.

At a meeting of the Derry guardians on Sept. 26th a resolution was passed "that any nurse or other female official in the service of the guardians who intends getting married must previously tender her resignation to this board." The motion was aimed at preventing indiscriminate visiting of the nurses, either on the part of husbands or friends, which prevented them discharging their difficult and responsible duties.

Sept. 30th.

[1] THE LANCET, Sept. 26th, 1903, p. 917.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Public Health in Paris.

THE inhabitants of Paris have of late had a false alarm owing to one of the daily papers having published a report that a case of cholera had occurred at the Pitié Hospital. The report was a much exaggerated account of the facts which were as follows. A patient who had been admitted from the suburbs to the Pitié Hospital under the care of Dr. Robin died after a short illness. Owing to the

circumstances of his illness and death a post-mortem examination was made when the case was discovered to be one of cholera nostras. Some such cases occur every year and, moreover, there was nothing infectious about the illness, but every measure of disinfection was rigorously carried out all the same. This is the only case of the kind which has been yet reported and no case of choleraic diarrhœa has been notified by any medical man practising in the district in which the Pitié Hospital lies. So far, too, the summer of 1903 has shown a very low mortality and infectious diseases—even infantile diarrhœa—have been far from frequent. M. Besançon, divisional superintendent at the Prefecture of Police, has just presented to the members of the council of hygiene of the Seine the figures for August, 1903, compared with those of the same month in 1901 and 1902. Typhoid fever showed 144 cases in 1903 and 210 in 1901 (1902 was not given). Small-pox showed 45 cases in 1903, as against 152 in 1901 and 31 in 1902. Diphtheria showed 258 cases in 1903, as against 309 in 1901 and 319 in 1902. Of cholera there were only four cases in 1903 and the same number in 1901. In 1902 there was only one case. As to measles, there were 376 cases in 1903.

Obituary.

On Sept. 27th there died at Mende M. Théophile Roussel, Senator and Member of the Institute. He was born at Saint-Chély-d'Apcher (Lozère) in 1816. He studied medicine and took his doctor's degree in 1845. In 1849 he was elected to represent his department for the first time and in turn he sat in the legislative assembly, in the national assembly, and finally in 1888 in the Senate as representing the Lozère. He was greatly interested in hygienic matters, in the repression of drunkenness, and in the condition of factory children. To him is due the Infant Life Protection Act with which his name will be ever associated. Since 1872 M. Roussel has been a member of the Academy of Medicine and he was also a member of the Academy of Moral and Political Sciences and a Commander of the Legion of Honour.—M. Boisseau, medical inspector-general of the Service de Santé, formerly an *agrégé* in hygiene and forensic medicine at the military school of Val-de-Grâce, has also recently died, and there are many who will recall to mind the ability and courtesy with which for many years he organised the army sanitary service. A solemn funeral service was held in the chapel at Val-de-Grâce under the presidency of the Minister of War.—Another death is that of Dr. Catelan, director of the sanitary service at the port of Marseilles. He was responsible for the organisation of the lazaretto at Frioul about which so much has been said. By a singular coincidence he died just at the moment when the plague broke out in Marseilles, although not from that disease.

Syphilis as an "Accident."

The courts have given judgment in the case to which I alluded in my letter in THE LANCET of Sept. 19th (p. 854) where a glass-blower, who alleged that he had contracted syphilis by using a blow-pipe lent to him by one of his fellow workmen, claimed damages from his employer for an "accident" under the Workmen's Compensation Act. The court nonsuited the workman on the ground that he had brought forward no proof that it was really in the course of his work that he had contracted syphilis in the manner indicated by himself. Moreover, the fellow workman whom he accused was examined medically and showed no trace of syphilis. The court, however, pointed out that those were the only reasons why it had nonsuited the workman and appeared to imply that if proof had been brought forward damages would have been granted.

Placental Opotherapy.

Various new researches have been made into the above subject which has entered upon an interesting phase. The origin of the matter, in France at any rate, was due to some work by M. Iscovesco who was aware of the fact that many female animals eat their placenta directly after the birth of their young and who supposed that in this instinctive act was some inspiration by nature. The administration of placenta in powder appears to have a favourable effect upon uterine involution and upon mammary secretion. M. Bouchacourt last year undertook some researches which, however, have not been followed up by others. He obtained some remarkable results by applying placenta in powder and found that it had really the property of increasing the secretion of milk, for he tried it in numerous cases in a maternity hospital which was under his charge. M. Chaleix-Vive of Bordeaux has just tried the same method of treatment in a number of women with defective secretion of milk. The results were altogether remarkable and the quantity of milk increased very rapidly. One very curious point, however, is that M. Chaleix-Vive, when he employed the same pharmaceutical preparation which had succeeded so well in the hands of M. Bouchacourt—viz., powdered and dried extract of placenta—found it completely inactive. On the other hand, he obtained very good results, quite comparable to those of M. Bouchacourt, by employing the drug in quite another form, that is to say, a glycerine extract of fresh placenta.

Sept. 29th.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Medical Man and the Law.

THE rights and privileges of the medical profession have in a recent case been encroached on in an almost incredible way by a judicial authority. The daily press gave the following report of the circumstances. On the evening of the Parliamentary elections at Laurahütte (Upper Silesia) great riots took place; a mob of some thousands of people, mostly Poles, destroyed shops and attacked the town-hall, so that the police had to charge, the result being that one of the rioters was killed and several were wounded. Proceedings were taken against the rioters by the public prosecutor; the names of several slightly injured men who had escaped were, however, unknown to the authorities, but it was ascertained that some of the wounded had gone to a medical man of the town, himself a Pole, to have their injuries dressed. The other day three detectives appeared at the residence of the medical man and showed a judge's order by which they were authorised to copy the names of the wounded rioters from the medical man's journal. When the medical man, Dr. Stcslicki, refused to deliver up his journal, the policemen, by order of the judge, forcibly removed the book from the medical man's residence to the judge's office. The names of two rioters were discovered in this way and the men were immediately arrested. These occurrences have been discussed at great length in the daily newspapers as well as in the medical journals and will certainly be thoroughly investigated by the provincial medical chamber and in Parliament. The law especially forbids the summoning of medical men as witnesses to give evidence in matters concerning their patients without being specially authorised by the patients. It is true that the provisions of the law as affecting medical men are in some respects obscure and the present case is the first of its kind, so that the Supreme Court has hitherto had no opportunity to decide on the matter. At all events the proceedings of the court, though perhaps not illegal, are obviously objectionable from an ethical point of view and prejudicial to the interests of the profession as well as of the patients. The consequence will be that henceforth injured persons who are in fear of legal prosecutions for some misdemeanour will abstain from consulting medical men and that the public will no longer have confidence that disclosures made to their medical advisers will be kept secret.

Workmen's Insurance.

The insurance of the working classes against illness and accidents has been made compulsory by the laws of 1882, 1885, and 1888 respectively. To be supported during illness the workmen must belong to sick clubs of different kinds, which are controlled by the local authorities and must supply their members not only with maintenance but also with medical attendance, medicine, and hospital accommodation free of charge. The law provides that one-third of the club's expenses are to be borne by the employers and two-thirds by the members. Recent statistics show that from the year 1885 to 1900 not less than 1,729 044,894 marks (about £86,000,000) have been paid by the clubs to their members for 733,000,000 days of sickness. Compulsory insurance against accidents is a charge on the employers exclusively, the workers having nothing to pay for it. For that purpose all the employers of a certain branch or industry, for instance, all the brewers or printers, are obliged to combine in an association under Government control (Berufsgenossenschaft)

which must grant an annual income to those workmen of their respective branch who have become invalids by an accident during employment. Since the date of the enactment of the law till 1900 927,813 working men and women received compensation for partial or total disablement through accidents. The sum paid to them by the Berufsgenossenschaften was 550,000,000 marks (£27,500,000). Since 1885 the general mortality in Germany has decreased from 2·75 to 2·18 per cent., which is certainly in great part due to the fact that the working classes are better cared for.

Sept. 29th.

NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

The Antiseptic Law relating to Barbers.

A STRINGENT law was passed by the last New York State Legislature regulating the business of barbers, the object being to secure a greater degree of cleanliness in the practice of their art. Under this law every practising barber must register and receive a licence and must conform to certain rules and regulations. These rules enforce antisepticism in a very pronounced form. Cleanliness of the hands must be secured by washing them in an antiseptic fluid after each "shave"; razors, scissors, and clippers must be treated with boiling water; powder puffs must be dispensed with; floors must be kept clean with antiseptic washing; and towels, sheets, and chairs must be antiseptically clean. The law has met with but little opposition, and will evidently greatly improve the condition of the average barber's shop. Upwards of 15,000 barbers have registered in the city of New York. The penalty of practising without a licence is $25 for the first offence and a possibility of imprisonment for from ten days to three months.

Temperance Instruction in the Public Schools.

Many years ago the Women's Christian Temperance Union began an agitation in favour of introducing into the public schools a system of medical instruction for the purpose of creating a sentiment or prejudice in the minds of the children of the country against the use of intoxicating beverages. Much success attended this effort and many States adopted the plan and passed laws regulating and making compulsory this feature of the common school education. The preparation of school books having the necessary texts relating to alcohol followed immediately. It happened, very naturally, that these texts were very crude in many instances and aroused much opposition from our most advanced educators to the system itself. In order to determine the present status of the question as to its efficiency and desirability an investigation was undertaken by a commission, the results of which have just appeared. The investigation was under the direction of Professor W. O. Atwater, Dr. J. S. Billins, Dr. R H. Chittenden, and Dr. W. H. Welch, each one of whom has the confidence of the country. The report will take rank among our most valuable public documents. The results of the investigation may be stated as follows. The object sought by these compulsory laws—viz., to inculcate habits of temperance among the young—was excellent, but the methods adopted to that end have proved defective. The defect is found in the trivial or misleading character of the instruction given. The conclusion of the commission, as expressed by a subcommittee, is that under the name of "scientific temperance instruction" there has been grafted upon the public school system of nearly all of our States an educational scheme relating to alcohol which is not scientific, temperate, or instructive. Failing to observe the distinction between the diametrically opposite conceptions of use and abuse some of its advocates have not hesitated to teach our children that the terrible results of a prolonged abuse of alcohol may be expected to follow any departure from the strict rules of total abstinence. The success which has attended the efforts of the Women's Christian Temperance Union to secure the desired legislation may be readily explained by the sympathy sure to be felt by all intelligent people with any sincere attempt to combat one of the most gigantic evils of modern times. There can be no doubt that the abuse of alcohol is a threat to our civilisation, and any honest effort to diminish its consumption is certain to be welcomed without any very critical examination of the methods employed. That the originators of this educational scheme were honest in their intentions there is no reason to doubt, but they have violated sound principles of pedagogy in forcing subjects upon the attention of children at an age when their minds cannot possibly be adapted to comprehend them, and have shown themselves absolutely indifferent to the demoralisation of our educational system resulting from forcing teachers to give instruction in a way which their experience has shown them to be ill adapted to accomplish the ends in view and from compelling children to memorise statements sure to be contradicted by the experience of their later lives.

Increase of Suicides in the United States.

The increase of suicides in the United States has been remarkable during the last decade. A careful study by an eminent statistician, Frederick L. Hoffman, shows that this increase has been most marked since 1890. His conclusions are based on a study of the vital statistics of 50 cities. As these cities have a population of 15,000,000 inhabitants in their combined capacity the results are regarded as conclusive of urban life. The percentage of suicides in some of the cities was as follows: St. Louis, Missouri, 25·7 per 100,000 of population; Hoboken, New Jersey, 23·4; Oakland, California, 22·5; New York, 21·2; Boston, 15·9; and Worcester, Massachusetts, 9·0. The aggregate number of persons who took their own lives in these 50 cities in a single year was 2452.

Uncinariasis, or Hook-worm Disease, in Porto Rico.

Several reports by United States officers have been made upon this peculiar parasitic disease of Porto Rico. The latest and most complete paper on this subject is by Surgeon Ashford of the United States Army and Assistant Surgeon King of the Public Health and Marine Hospital Service. It appears that over 30 per cent. of the deaths in Porto Rico reported by the Superior Board of Health for the four months, September to December, 1902, were charged to anæmia, the form which this disease assumes. This is believed to be below the actual facts because deaths due to complications of uncinariasis are reported under many complications. It seems, indeed, to be one of the most prominent economical questions of the island, for it is estimated that it is the scourge of 90 per cent. of the agricultural population and that 75 per cent. of those infected show decided symptoms. It is the opinion of these writers that a toxin of a hæmolytic nature is developed by the parasite which is absorbed into the blood and exercises its destructive action directly upon the hæmoglobin. The disease has been regarded as practically incurable but these writers state that it may be cured in the vast majority of cases if the patients are treated properly. For the expulsion of the parasite large doses of thymol are most efficient and for the regeneration of the blood large doses of iron carbonate were relied on. It is believed that the energetic efforts of the present health authorities will greatly diminish the prevalence of the pest if it is not altogether eradicated.

Change in Admission to the Army Medical School.

The plan of admission to the Army Medical School requires that the applicant shall be a graduate of a reputable medical school and have had at least six months' practice in hospital or the equivalent. The examinations are to be conducted under the supervision of a board of medical officers of the army and candidates who pass the entrance examinations with a mark of 80 per cent. or over will be entered in the school. The new plan for admission is to place on the list of eligibles for commission as assistant surgeons in the medical corps of the army all graduates of the medical school who shall have passed the final examination with a mark of 80 per cent. or over. During their course at the school they will be paid $100 per month. The scholastic year is from Oct. 31st to May 1st and graduates will be selected for commissions in the order of their standing.

Sept. 18th.

DEVON AND CORNWALL EAR AND THROAT HOSPITAL, PLYMOUTH.—A strong appeal has just been made by the committee of this institution for donations to pay off the £1200 mortgage on the hospital building. The Mayor has given ten guineas and it is hoped that the required amount will be raised shortly.

Obituary.

WILLIAM EDMUND IMAGE, F.R.C.S. ENG.

WE have to announce the death, at the great age of 96 years, of Mr. William Edmund Image of Herringswell House, Mildenhall, Suffolk. Mr. Image truly belonged to a bygone generation. Born eight years before the battle of Waterloo he received his early education in Paris, graduating as Bachelier ès Lettres in 1828 at a time when the *rapprochement* between France and England brought about by the downfall of Napoleon was very sincere. He then became a medical student in London, joining Guy's Hospital and attending the joint lectures of Guy's and St. Thomas's Medical Schools. Upon being qualified he settled in the quaint old Suffolk capital—Bury St. Edmunds—where he soon acquired a large general practice and made at the same time a reputation of being a skilful surgeon according to the practices of those days. In 1844 Mr. Image, in deference to his position of consulting surgeon to the West Suffolk Hospital at Bury St. Edmunds, was elected one of the first batch of Honorary Fellows of the Royal College of Surgeons of England, and some 20 years later he retired from practice to live the life of a country gentleman. Mr. Image was twice married and leaves a son by his first wife—Dr. Francis Edward Image of Bury St. Edmunds. Mr. Image's second wife, whom he married late in life, was a lady of considerable property, a fact which conduced to the appointment of Mr. Image as High Sheriff of the county at the advanced age of 80 years.

DAVID ILLTYD JONES, L.R.C.P., L.R.C.S. EDIN., L.M., L.F.P.S. GLASG.

AT Southsea, Hants, on Sept. 25th, the death took place of Mr. David Illtyd Jones, second son of the late Rev. J. Jones, vicar of Abergwessyn, Breconshire, and brother of Dr. J. Arnallt Jones, J.P., of Aberavon and of the Rev. Ifor Jones of Llandovery College. The deceased gentleman had gone to Southsea for a change of air and whilst there was seized by illness which rapidly proved fatal. Mr. Illtyd Jones was educated at Llandovery College during the wardenship of the present Bishop of St. Asaph and was a frequent attendant at the reunion of his old school. He received his professional training at Edinburgh and had practised at Aberavon, Kidwelly, and Abergwynfi, where his genial disposition and kindly manner will not be forgotten and his death, in spite of his fine physique, at the early age of 39 years will be lamented by many former patients and friends. He leaves a widow, a daughter of the late Colonel C. Pasley Roberts of the Royal Horse Artillery. His remains were interred in the burial ground of Penllergaer Church in the parish of Llangyfelach, Glamorganshire, on Michaelmas Day.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—The following gentlemen having passed the necessary examinations and having conformed to the by-laws and regulations have been admitted Members of the College and have received their diplomas:—

George Charles Johnston Acres and Wilfrid Ashwell Aldred, St. Bartholomew's Hospital; George Cuthbert Adeney, St. Thomas's Hospital; Charles Alexander Anderson, B.A. Camb., Cambridge University and St. Bartholomew's Hospital; William Fraser Annand, University College Hospital; William Appleyard, Yorkshire College and General Infirmary, Leeds, and University College Hospital; Harold Balme, King's College Hospital; Thomas St. John Barry and Francis Barton, University College and Royal Infirmary, Liverpool; Edward Leslie Bartlett, St. Mary's Hospital; Henry Stagg Bennett, St. Thomas's Hospital; Kenneth Black, L.D.S. Eng., Guy's Hospital; William Edward Blackall, Oxford University and King's College Hospital; Percy Reginald Bolus, Guy's Hospital; Aboyn Hewett Bradley, University of Birmingham; Desborough Brodie, St. George's Hospital; Joseph Burfield, St. Bartholomew's Hospital; Robert Miles Fletcher Cameron, Melbourne University and St. Thomas's Hospital; William Wellesley Campbell, King's College Hospital; Paul Campiche, M.D. Switzerland, Lausanne, Freiburg and Berlin Universities; Herbert Melville Churchill, London Hospital; Francis Gerrard Hamilton Cooke, University College Hospital; John Sephton Cooper, Cambridge University and Guy's Hospital; Robert Harry Lucas Corbiner, St. George's Hospital; Thomas Reginald Coukbrey, St. Bartholomew's Hospital; Herbert Hugh Blair Cunningham, St. Mary's Hospital; Harold Stuart Cassan Darbyshire, University College, Sheffield, and St. Thomas's Hospital; Hugh Morriston Davies, B.A. Camb., Cambridge University and University College Hospital; Charles Noel Davis, St. Bartholomew's Hospital; Arthur Marcellus De Silva, Ceylon Medical College and London Hospital; Alexander Henry Donaldson, Cambridge University and St. Bartholomew's Hospital; Hugh Basil Drake, L.S.A. Lond., St. George's Hospital; Edgar Severn Ellis, St. Bartholomew's Hospital; Evan Robert Evans, University College, Liverpool, and St. Mungo's College and Royal Infirmary, Glasgow; Thomas Jefferson Faulder, B.A. Camb., Cambridge University and St. Bartholomew's Hospital; Hugh Herbert James Fawcett, B.A. Camb., Cambridge University and St. Mary's Hospital; Neville Samuel Finzi, L.S.A. Lond., University College Hospital; William Henry France, Westminster Hospital; Charles Frederick Fraser, Guy's Hospital; John Goss, B.A. Camb., Cambridge University and Guy's Hospital; Charles Bernard Goulden, B.A. Camb., Cambridge University and Middlesex Hospital; Edward Reginald Griffiths, Middlesex Hospital; Robert George Ernest Grote, Charing Cross Hospital; Thomas Barker Amyand Haggard, B.A. Camb., Cambridge University and St. Bartholomew's Hospital; George Hall and Bernard Hart, University College Hospital; Percy Hardy, B.A. Camb., Cambridge University and London Hospital; Richard Neville Hart, B.A. Camb., Cambridge University and King's College Hospital; Frank Arthur Hepworth, B.A. Camb., Cambridge University and St. Bartholomew's Hospital; William Perceval Kingston, Middlesex Hospital; Archibald Henry Hogarth, B.A. Oxon., Oxford University and St. Bartholomew's Hospital; Eardley Lancelot Holland, King's College Hospital; Gerald Wetherell Capron Hollist, L.R.C.P. Ed., L.S.A. Lond., Guy's Hospital; Conrad Meredyth Hinds Howell, Oxford University and St. Bartholomew's Hospital; Cecil Hugh Myddelton Hughes, Westminster Hospital; Guy Hughes, St. Bartholomew's Hospital; Daniel Morgan Humby, L.D.S. Lond., Middlesex Hospital; Charles Edward Iredell, Guy's Hospital; Alfred Edward Johnson, Owens College and Royal Infirmary, Manchester; Charles Owen Jones, M.B., Ch.B. Vict., University College and Royal Infirmary, Liverpool; Edward James Jones, Owens College and Royal Infirmary, Manchester, and St. Thomas's Hospital; William Phillips Jones, L.S.A. Lond., University College, Sheffield, and University College Hospital; Khursedji Nasserwanji Karanjia, Grant Medical College, Bombay, and University College Hospital; Wharram Henry Lamplough, University of Birmingham and St. Bartholomew's Hospital; Reginald Larkin, Guy's Hospital; Charles Hugh Latham, St. Thomas's Hospital; Dumaresq Le Bas, St. Mary's Hospital; Percy Gonville Lock, B.A. Camb., Cambridge University and St. George's Hospital; John Morrison McIlroy, Queen's College and Royal Hospital, Belfast; Robert Martin McQueen, University College, Bristol, and St. George's Hospital; Ernest Edgar Maples, St. Bartholomew's Hospital; Farquhar Mackenzie Matheson, B.A. Camb., Cambridge University and University College Hospital; Norman Sinclair Meiklejohn, St. George's Hospital; George Christian Blake Moeville, University College Hospital; Edwin Henry Britton Milsom, Guy's Hospital; William Ernest Miul, B.A. Camb., Cambridge University and Middlesex Hospital; Anthony Richard Neligan and Charles Pere Nicoll, St. Bartholomew's Hospital; Leonard Noon, M.A., B.C. Camb., Cambridge University and St. Bartholomew's Hospital; Harry Overy, M.B., Ch.B. Edin., Edinburgh University and London Hospital; Percy Alfred Peall, Guy's Hospital, Frederick Harold Pickin, University College, Bristol; Frederick James Pierce, Charing Cross Hospital; Allen Pledger Piggott, Guy's Hospital; Henry William Plant, B.A. Lond., Birmingham University; John Mackay Plews, St. Bartholomew's Hospital; John Milnes Pooley and Palmer Devoy Ramsay, St. Mary's Hospital; Charles Derwent Pye-Smith, University College, Sheffield, and Guy's Hospital; Robert Clark Redmond, B.A., M.D. Kingston, Kingston and Ontario Universities and University College Hospital; Robert Vachelde Acton Redwood, University College, Cardiff, and St. Mary's Hospital; Robert Watson Reid, M.B., Ch.B., Aberdeen University and King's College Hospital; Carl Henry Reinhold, Guy's Hospital; George Quinton Richardson, L.R.C.P. & S. Irel., Dublin and Charing Cross Hospital; Randolph Henry Neilson Rutherford, University College, Bristol; Stanley Riley and David Lindley Sewell, Owens College and Royal Infirmary, Manchester; Bernard Moore Sampson, St. Thomas's Hospital; Francis Broughton Shettle, St. George's Hospital; Geoffrey Richard Slade, B.C. Camb., Cambridge University and London Hospital; Sandy Spencer, Owens College and Royal Infirmary, Manchester; Herbert Douglas Smart, Neville Ivens Spriggs, and Frank Leslie Thomas, M.B. Lond., Guy's Hospital; Robert John Percy Thomas, St. Bartholomew's Hospital; Thomas James Bell Thomas and Louis Leopold Arthur William Thomson, St. Mary's Hospital; William Bartholomew Valle, London Hospital; Asa Claude Ali Van Buren, B.A. Lond., St. Bartholomew's Hospital; Ernest Ward, M.A. Camb., Cambridge University and London Hospital; Lewis Wayne-Morgan, University College, Cardiff, and Middlesex Hospital; William Tudor Webb, University College, Bristol; John Herbert Wells, St. Mary's Hospital; Edwin Robert Wheeler and Ernest Ulysses Williams, King's College Hospital; Arthur Denham White, St. Bartholomew's Hospital; Gwynne Evan Owen Williams, University College Hospital; Thomas John Williams, University College and Royal Infirmary, Liverpool; Robert Horsee Constable Owen Wisdom, Cambridge University and London Hospital; Eric Alfred Wright, B.A. Camb., Cambridge University and St. Bartholomew's Hospital.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held in September the following candidates passed in the subjects indicated:—

Surgery.—W. V. Braddon (Section II.), Cambridge and Manchester; W. H. Bush (Sections I. and II.), Guy's Hospital; K. R. Jay, Royal Free Hospital; A. Jurriaanse (Sections I. and II.), and P. S. Klots, Leyden; L. W. Roberts, Middlesex Hospital; S. H. Ryan (Sections I.

and II.), Manchester; and A. Turner (Section II.), Charing Cross Hospital.

Medicine.—J. E. L. Bates and W. H. Bush (Sections I. and II.), Guy's Hospital; L. E. Ellis (Section II.), St. George's Hospital; A. H. Falkner (Section II.), Cambridge and St. Mary's Hospital; A. Jurriaanse (Sections I. and II.), Leyden; N. O. Roberts (Section I.), Cambridge and St. Mary's Hospital; F. Robinson (Sections I. and II.) and S. H. Ryan (Section I.), Manchester; F. J. Waldmeier, London Hospital; and J. W. Watson (Section I.); Manchester.

Forensic Medicine.—J. E. L. Bates, Guy's Hospital; W. V. Braddon, Cambridge and Manchester; A. Jurriaanse, Leyden; E. H. Price, Birmingham; N. O. Roberts, Cambridge and St. Mary's Hospital; F. Robinson and S. H. Ryan, Manchester; and R. Wallace and R. Watson, Glasgow.

Midwifery.—W. B. Harris, St. Mary's Hospital; A. Jurriaanse, Leyden; R. Reynalds, Bristol; F. Robinson and S. H. Ryan, Manchester; and A. Williamson, Royal Free Hospital.

The diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—J. E. L. Bates, L. E. Ellis, and A. Jurriaanse.

UNIVERSITY OF DURHAM.—At the third examination for the degree of Bachelor in Medicine held in September the following candidates satisfied the examiners:—

First class Honours: Lewis Augustus Clutterbuck, L.R.C.P. & S. Edin., L.R.C.P. Irel., College of Medicine, Newcastle-upon-Tyne.

Second-class Honours: Olga Alberta Schiele, London School of Medicine for Women; and Reginald Inglis Douglas, St. Bartholomew's Hospital, London.

Pass list: James Henry Cooke, William Cowden, Hugh Boyd Cunningham, William Ernest Falconar, Saville James Fielding, William Purton Allan Hardwicke, L.S.A., and Arthur Henry Hogg, College of Medicine, Newcastle-upon-Tyne; Bernard Warner Lacey, Guy's Hospital; Frederick Robert Henry Laverick, William Ernest Craven Lunn, Samuel Leslie McBean, Francis Henry Moxon, Charles Duncan Relton, William Seymour, and Frank Tomisman Simpson, College of Medicine, Newcastle-upon-Tyne; Francis Rupert Snell, St. Thomas's Hospital, London; Thomas John Samuel Suffield, L.R.C.P., L.S.A., London Hospital; Edward Tate, College of Medicine, Newcastle-upon-Tyne; Janet Arthur Vaughan, London School of Medicine for Women; Tys Visser, College of Medicine, Newcastle-upon-Tyne; and Ernest Young, St. Mary's Hospital, London.

FALMOUTH HOSPITAL.—As a result of the Friendly Societies Hospital Saturday and Sunday collections, the sum of £73 has been raised for the Falmouth Hospital.

ALCOHOL.—An international exhibition of the manufacture and industrial applications of alcohol will be held in Vienna in April and May, 1904.

MEDICAL MAGISTRATE.—Dr. William Duncan, obstetric physician to the Middlesex Hospital, has been placed on the Commission of the Peace for Buckinghamshire by Lord Rothschild, Lord Lieutenant of the county.

PRESENTATION TO A MEDICAL PRACTITIONER.—Mr. W. F. Willis, who has resigned his position as assistant medical officer of the Devon County Asylum, Exminster, has been presented with a silver salver by the officers and staff of the asylum.

FIRE AT A LUNATIC ASYLUM.—A fire broke out on Sept. 21st at the Fisherton House Lunatic Asylum at Salisbury. It was discovered in the apartments of the night nurses but the local fire brigade prevented it from spreading. No lives were lost.

COMPENSATION TO WORKMEN.—Under the Workmen's Compensation Acts the county-courts of England and Wales awarded £44,353 in 1902 to the families of men who lost their lives during their employment, the average sum per life being about £168.

UNIVERSITY OF LONDON.—Two courses of lectures in advanced physiology will be given at this University during the present session. Commencing on Oct. 16th Dr. F. W. Mott, F.R.S., will lecture on the Structure and Functions of the Cerebral Cortex and on Oct. 20th Dr. G. A. Buckmaster will lecture on the Blood. Instead of Dr. Buckmaster's lecture on Oct. 13th as advertised Dr. A. D. Waller will lecture on the Anæsthetic Action of Chloroform and Ether. Admission to the lectures is by ticket, to be obtained from the academic registrar.

GUY'S HOSPITAL MEDICAL SCHOOL.—The following entrance scholarships and certificates have been awarded:—Senior Science Scholarship for university students, £50, Mr. C. W. Greene, B.A., Emmanuel College, Cambridge, and certificate to Mr. H. L. Deck, Sydney University Medical School. Junior Scholarships in Science: Mr. H. A. Sanford, Guy's Hospital, £150; Mr. L. T. Baker, Dulwich College, £60; and certificates to Mr. W. Johnson, Guy's Hospital, and Mr. V. Townrow, University College, Sheffield. Entrance Scholarships in Arts: Mr. J. R. Perdran, Royal College of Mauritius, £100; Mr. S. J. Darke, Owen's School, Islington, £50; and certificates to Mr. G. B. Cockrem, King's School, Canterbury, Mr. A. N. Gullick, Felsted School, and Mr. A. G. W. Owen, University College, Bangor.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.—The following are the names of those members who have been elected to serve as officers and members of the council of this society for 1903–04:—President: Dr. Seymour Taylor. Vice-presidents: Mr. G. E. Twynam, Mr. W. P. Mallam, Dr. W. T. Gardner, Mr. C. B. Keetley, Mr. W. P. Barrett, Dr. G. H. D. Robinson, Mr. J. R. Lunn, and Dr. E. Furniss Potter. Council: Dr. G. P. Shuter, Mr. R. Pollock, Dr. A. M. Ross Sinclair, Dr. A. Whitfield, Mr. G. A. Simpson, Mr. H. Percy Dunn, Mr. W. McAdam Eccles, Dr. W. H. Walter, Mr. E. P. Paton, Dr. E. A. Saunders, Dr. A. J. Rice Oxley, and Mr. Tennyson D. Patmore. Treasurer: Mr. T. Gunton Alderton. Secretaries: Dr. C. Buttar and Dr. A. Elliot. Librarian: Mr. H. W. Chambers. Editor of Journal: Dr. L. C. T. Dobson. Editorial secretary of journal: Mr. J. G. Pardoe.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B. ET FILS, 19, rue Hautefeuille, Paris.

Les Médications Reconstituantes. La Médication Phosphorée: Glycéro-phosphates, Lecithines, Nucléines. Par Henri Labbé, Chef de Laboratoire à la Faculté de Médecine de Paris. ("Les Actualités médicales" series.) Price 1 fr. 50.

BAILLIÈRE, TINDALL, AND COX, 8, Henrietta-street, Covent-garden, W.C.

Aids to Physiology. By Peyton T. B. Beale, F.R.C.S. Eng., Examiner in Physiology to the Society of Apothecaries. Price 3s. 6d.

CHURCHILL, J. & A., 7, Great Marlborough-street, W.

The Refraction of the Eye: A Manual for Students. By Gustavus Hartridge, F.R.C.S., Senior Surgeon to the Royal Westminster Ophthalmic Hospital. Twelfth edition. Price 6s.

HEINEMANN, WILLIAM, 20 & 21, Bedford-street, W.C.

The Alien Immigrant. By Major W. Evans Gordon, M.P. (lately a Member of the Royal Commission on Alien Immigration). Price 6s. net.

MACMILLAN AND CO., LIMITED, London.

Modern Methods in the Surgery of Paralyses. With Special Reference to Muscle-Grafting, Tendon-transplantation, and Arthrodesis. By A. H. Tubby, M.S. Lond., F.R.C.S. Eng., Surgeon to and Lecturer on Clinical and Orthopædic Surgery and in Charge of the Orthopædic Department at Westminster Hospital, and Robert Jones, F.R.C.S.E., Honorary Surgeon to the Royal Southern Hospital, Liverpool. Price 10s. net.

SPRINGER, JULIUS, Berlin.

Ueber die Vernichtung von Ratten an Bord von Schiffen als Massregel gegen die Einschleppung der Pest. Von Physikus Dr. Necht, Hamburgischem Hafenarzt, und G. Giemsa, Chemisch-pharmazeutischem Assistent. (Aus der Institut für Schiffs- und Tropenkrankheiten in Hamburg.) Sonderabdruck aus "Arbeiten aus dem Kaiserlichen Gesundheitsamte." Band XX., Heft 1, 1903. Price not stated.

VIGOT FRÈRES, 23, Place de l'École de Médecine, Paris.

Sadisme et Masochisme. Par le Dr. Emile Laurent. (Les Perversions Sexuelles: Physiologie-Psychologie-Therapeutique. XI.) Price 3 fr. 50.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

ALEXANDER, A. F., L.R.C.P. Lond., M.R.C.S., has been appointed Extern Midwifery Assistant to St. Bartholomew's Hospital.

AMSLER, A. M., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Surgeon to St. Bartholomew's Hospital.

AUBREY, THOMAS, M.B., L.R.C.P. Lond., M.R.C.S., has been appointed District Medical Officer by the Bridgwater Board of Guardians.

BRAINE-HARTNELL, C., M.R.C.S., L.R.C.P. Lond., has been appointed Clinical Assistant to the Chelsea Hospital for Women.

BRIGSTOCKE, CHARLES ARTHUR, M.R.C.S., L.S.A., has been re-appointed Medical Officer of Health for Haverfordwest.

BROWN, C. R. V., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Physician to St. Bartholomew's Hospital.

BROWN, G. H., M.B., Ch.B. Viet., has been appointed Junior House Surgeon to the Salford Royal Hospital.

CLAPP, GEORGE TUCKER, M.B. Cantab., M.R.C.S., has been appointed Medical Officer to the Exeter Diocesan Training College.

CURTIS, J. C., L.R.C.P. Lond., L.R.C.S., has been appointed Clinical Assistant to the Chelsea Hospital for Women.

DIX, C., M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon to the Salop Infirmary, Shrewsbury.

ELMSLIE, R. C., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Surgeon to St. Bartholomew's Hospital.

ETHERINGTON-SMITH, R. B., M.R.C.S., L.R.C.P. Lond., has been appointed Ophthalmic Surgeon to St. Bartholomew's Hospital.

FARNCOMBE, E. L., L.R.C.P. Lond., M.R.C.S., has been appointed Extern Midwifery Assistant to St. Bartholomew's Hospital.

FAULDER, T. J., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Surgeon to St. Bartholomew's Hospital.

GOULD, H. U., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Physician to St. Bartholomew's Hospital.

HEPBURN, DAVID, M.D., C.M., F.R.S. Edin., M.R.C.S., has been appointed Professor of Anatomy at University College, Cardiff.

HOGARTH, A. H., has been appointed Junior House Physician to St. Bartholomew's Hospital.

HOLMES, H. G., M.B., M.Ch. Syd., has been appointed Government Medical Officer and Vaccinator at Warialda, New South Wales.

JEUDWINE, W. W., M.B., B.C. Cantab., has been appointed Senior House Physician to St. Bartholomew's Hospital.

LAW, R. R., M.D., B.C. Cantab., has been appointed Clinical Assistant to the Chelsea Hospital for Women.

LOVE, H., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Surgeon to St. Bartholomew's Hospital.

MACFADYEN, N., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Physician to St. Bartholomew's Hospital.

MARTIN, E. L., has been appointed Senior House Physician to St. Bartholomew's Hospital.

MCCALL, HON. JOHN, M.B., C.M. Glasg., has been appointed President of the Central Board of Health, Tasmania.

NOKE, F. H., M.B. Lond., has been appointed Senior House Physician to St. Bartholomew's Hospital.

NOON, L., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Surgeon to Bartholomew's Hospital.

PAYNE, J. E., has been appointed Junior House Physician to St. Bartholomew's Hospital.

PENNY, H. J., L.R.C.P.C.P. Irel., has been appointed Public Vaccinator for the District of Portland, Tasmania.

PETRIE, A. S., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Surgeon to St. Bartholomew's Hospital.

PRINGLE, E. G., M.R.C.S., L.R.C.P. Lond., has been appointed Senior House Physician to St. Bartholomew's Hospital.

RANKIN, R. M., has been appointed Senior House Physician to St. Bartholomew's Hospital.

SCOTT, ROBERT GILLESPIE, M.B., C.M. Edin., has been appointed Honorary Medical Officer to the Hobart Hospital, Tasmania.

SHAW, RAYMOND HENRY, M.S., M.B. Dunelm, has been appointed Assistant Surgeon to the Great Yarmouth Hospital.

SNELL, E. H., M.D., B.Sc. Lond., D.P.H. Cantab., F.R.S.E., has been re-appointed Medical Officer of Health to the City of Coventry.

STATHAM, H., M.R.C.S., L.R.C.P. Lond., has been appointed Junior House Surgeon to St. Bartholomew's Hospital.

STONEY, ROBERT BINDON, M.B., Ch.B., B.A.O. Dub., has been appointed Medical Officer for the Aboriginal Station at Cumeroogunga, New South Wales.

SYMES, WILLIAM HENRY, M.D., M.S. Edin., has been appointed Public Vaccinator at Christchurch, New Zealand.

WALLIS, C. EDWARD, M.R.C.S., L.R.C.P. Lond., L.D.S., has been appointed Dental Surgeon to Feltham School, under the London County Council.

WARD, V. G., M.B. Lond., has been appointed Senior House Surgeon to St. Bartholomew's Hospital.

WATERFIELD, N. E., M.B. Lond., has been appointed Junior House Surgeon to St. Bartholomew's Hospital.

WENHAM, H. V., M.B. Lond., has been appointed Senior House Surgeon to St. Bartholomew's Hospital.

YOUNG, C. G., M.D., M.Ch. Dub., has been appointed Clinical Assistant to the Chelsea Hospital for Women.

YOUNG, E. E., has been appointed Resident Midwifery Assistant to St. Bartholomew's Hospital.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BEDFORD COUNTY HOSPITAL.—Senior House Surgeon. Salary £100 a year, with apartments, board and washing.

BRENTFORD UNION.—Medical Officer and Public Vaccinator. Salary £110 per annum, with fees.

CAMBRIDGESHIRE, &c., LUNATIC ASYLUM, Fulbourn.—Second Assistant Medical Officer, unmarried. Salary £120, with board, lodging, and attendance.

CARLISLE, CUMBERLAND AND WESTMORLAND ASYLUM, Garlands.—Senior Assistant Medical Officer. Salary £150 per annum, rising to £180, with board, lodging, and washing.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST, Victoria-park, E.—Physician to Out-patients.

DERBY COUNTY ASYLUM.—Junior Assistant Medical Officer. Salary £120, rising to £150, with board, &c.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark.—House Physician and House Surgeon. Salary £80 respectively, with board, residence, and washing. Also Assistant House Surgeon. Salary £70, with board, residence, and washing.

GREAT YARMOUTH HOSPITAL.—House Surgeon. Salary £90 per annum, with board, lodging, and washing.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians for six months. Honorarium of £25.

LEICESTER INFIRMARY.—Clinical Clerk for six months. Honorarium of £10 10s., with board, apartments, and washing.

LIVERPOOL INFIRMARY FOR CHILDREN.—Assistant House Surgeon for six months. Salary £30, with board and lodging.

LIVERPOOL WORKHOUSE, Brownlow-hill.—Assistant Medical Officer. Salary £80 per annum, with rations, and additional fees.

MARGATE, ROYAL SEA-BATHING HOSPITAL.—Resident Surgeon. Salary at rate of £80 per annum for first six months and £120 per annum for second six months, with board and residence.

METROPOLITAN HOSPITAL, Kingsland-road, N.E.—Physician; also Assistant Physician.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Surgeon. Salary £100, with board, lodging, and washing.

PADDINGTON GREEN CHILDREN'S HOSPITAL, London, W.—House Physician, also House Surgeon both for six months. Salary at rate of 50 guineas a year, with board and residence.

PADDINGTON INFIRMARY.—Clinical Assistant and Second Assistant to the Medical Superintendent, unmarried, for six months. Honorarium of £36, with board, lodging, and washing.

ST. BARTHOLOMEW'S HOSPITAL.—Physician; also Surgeon.

ST. GEORGE'S AND ST. JAMES'S DISPENSARY, 60, King-street, Regent-street, W.—Honorary Physician.

ST. MARY'S HOSPITAL FOR SICK CHILDREN, Plaistow, E.—Resident Medical Officer, unmarried. Salary at rate of £100 per annum, with board, residence, and laundry. Also Assistant Resident Medical Officer, unmarried, for six months. Salary at rate of £80 per annum, with board, residence, and laundry.

ST. PAUL'S HOSPITAL FOR SKIN AND GENITO-URINARY DISEASES, Red Lion-square, W.C.—Honorary Assistant Surgeon.

SAMARITAN FREE HOSPITAL FOR WOMEN, Marylebone-road, N.W.—Clinical Assistants.

STAFFORD, COTON HILL LUNATIC HOSPITAL.—Assistant Medical Officer. Salary £125 per annum, with increase, board, lodging, and washing.

TORBAY HOSPITAL, Torquay.—House Surgeon. Salary £100 per annum, with residence, board, and washing.

WESTMINSTER HOSPITAL, Broad Sanctuary, S.W.—Fourth Assistant Physician.

WESTON-SUPER-MARE.—House Surgeon, unmarried. Salary £100 per annum, with board and residence.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.—House Physician. Salary £100 per annum, with board, lodging, and washing.

YORK DISPENSARY.—Resident Medical Officer, unmarried. Salary £120 a year, with board, lodging, and attendance.

The Chief Inspector of Factories, Home Office, S.W., gives notice of vacancies as Certifying Surgeons under the Factory Act at Biddulph, in the county of Stafford; at Southend, in the county of Essex; and at Perth, in the county of Perth.

Births, Marriages, and Deaths.

BIRTHS.

ATKEY.—On Sept. 17th, at The Avenue, Southampton, the wife of P. J. Atkey, M.R.C.S., L.R.C.P., D.P.H., of a daughter.

DAVEY.—On Sept. 25th, at Hill House, Walmer, Kent, the wife of Ernest Llewellyn Davey, L.R.C.P. Lond., M.R.C.S. Eng., of a son.

FRANCIS.—On Sept. 25th, at Northam, North Devon, the wife of J. Edmund Francis, M.R.C.S., of a daughter.

MARRIAGES.

ANGUS—ARNISON.—At St. James's Church, Newton Hall, Stocksfield-on-Tyne, on the 23rd inst., by the Rev. A. Swire, rector of Newton Hall, Henry Brunton Angus, M.B., M.D. Dunelm, F.R.C.S. Eng., eldest son of J. Acworth Angus, M.R.C.S. Eng., L.S.A. Lond., Newcastle-on-Tyne, to Maude, youngest daughter of the late J. S. Arnison, Sandiford House, Newcastle-on-Tyne.

COLTART—MCCALLUM.—At the Congregational Church, Llandudno, on the 22nd inst., by the Rev. Irvon Davies, Wilfred Henry Coltart, M.B. Lond., M.R.C.S., L.R.C.P., second son of William Coltart, Esq., J.P., of Warwick, to Janet Malcolm Mary McCallum, youngest daughter of the late Rev. Gilbert McCallum, of Monk-bridge House, Headingley, Leeds.—At home Oct. 27th and 28th, 70, Willow-street, Oswestry.

EWART—GREEN.—On Sept. 2nd, at St. Philip and St. James, Oxford, by the Rev. C. J. Burrough (cousin of the bride), David Ewart, M.B., Ch.B., F.R.C.S. E., of Chichester, to Mabel, second daughter of the late Mr. T. Green, The Willows, Jesmond.

HARDENBERG—WEALL.—On Sept. 24th, at St. Andrew's Church, Watford, by the Rev. Canon Reith, assisted by the Rev. O. Cockrem, LL.D., and the Rev. R. J. Glenn, Edward Francis Herman Hardenberg, M.B., M.R.C.S., L.R.C.P., of Duffield House, Watford, to Annie Margaret Graham (Daisy), second daughter of John Weall, of Rutland Lodge, Watford.

DEATHS.

BLACKSTONE.—On Sept. 27th, at Albert-terrace, Regent's Park, N.W., Joseph Blackstone, M.R.C.S. Eng., in his 65th year.

HUMPHREYS.—On Sept. 28th, at Poona, India, George Frederick Humphreys, Lieutenant I.M.S., only son of F. W. Humphreys, F.R.C.S., in his 24th year.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE PULQUE AND MESCAL OF MEXICO.

IN the *Scientific American* of Sept. 19th Mr. Charles R. Dodge gives a description of the manufacture of pulque and mescal in Mexico. He says that on the plains of Apam in that country there are vast plantations of "maguay," and that for from 50 to 100 miles on the different railways little else will be seen than these agaves, in all stages of growth from young plants up to those of mammoth size, which latter are seven or eight years old. These plantations produce the national beverage called "pulque," for the sale of which there are upwards of a thousand shops in the city of Mexico. The maguay plantations of the three States of Hidalgo, Tlaxcala, and Puebla are valued at nearly $15,000,000 (£3,000,000), while the railways have carried over 80,000 tons of pulque in a single year. Many species of agave yield pulque, the agave Americana, agave potatorum, and agave salmiana being the most important. When a plant reaches maturity it throws up an immense stalk, sometimes 25 feet high, upon the branches of which the blossoms appear. A long incision is made in the heart or central thickened portion of a blossom bud, and the tender leaves of the unopened leaf-cluster are cut away. The opening thus produced is scraped and deepened until a cavity is made, into which the juices of the fully-grown expanded leaves slowly filter, forming a sweetish, slightly acid liquor known as "aguamiel" (honey water). It is removed night and morning and can be collected from a plant for a month or more, about four quarts being the average daily product. This goes on until the plant is exhausted and the leaves are withered. At the warehouse the pulque is transferred to the reservoirs and a little sour pulque is added to induce fermentation. At a certain stage of fermentation the liquor is quite intoxicating. The earliest use of pulque is said to date back to the latter half of the eleventh century. Mescal is a very intoxicating liquor, also obtained from an agave but not from the same species as yield pulque. Mescal distilleries are found in every part of Mexico, the most noted being those in the small town of Tequila. The agave which yields mescal sends forth narrow leaves from a great bulb-like cellular mass which forms the heart of the plant. This heart, when denuded of its stiff, sword-like leaves, is detached from the root, cut in two, and roasted. A fire is made with wood in a pit four or five feet deep and considerably wider, and the cleft heads of the mescal plants are heaped over the burning mass until a huge mound is formed which is eventually covered with earth and left for several days. When the mound is opened the contents, still hot and steaming, are ground to a pulp by a revolving stone crusher worked by a mule; the semi-liquid mass is then fermented in vats and the mescal is finally obtained by distillation. Another very strong Mexican liquor called "zotol" is produced in the more northern parts of the country from a small species of agave with extremely narrow leaves. To the foregoing account by Mr. Dodge we may add that the name of "mescal buttons" has also been given to the dried tops of anhalonium Lewinii, a cactus growing in Mexico and much used by the Indians on account of its intoxicating and vision-producing qualities. This cactus was first described by Lewin and Henning in 1885. In America its properties were investigated by Mr. John Mooney, Professor Prentiss, and Dr. Morgan in 1894 and 1895. In England Mr. Havelock Ellis wrote on mescal (i.e., anhalonium) intoxication in THE LANCET of June 5th (p. 1540) and 12th (p. 1636), 1897, and in the *Contemporary Review* for January, 1898.

THE ORGANIC CHEMISTRY TEST AT THE UNIVERSITY OF LONDON.

To the Editors of THE LANCET.

SIRS,—Can you inform me whether any stand has yet been made by external London University medical students against the unreasonable rule that candidates between the Preliminary Scientific Examination and the Intermediate Examination for the M.B. must pass the organic chemistry test in or before July next or else pass the whole Preliminary Scientific Examination again?

I am, Sirs, yours faithfully,

Sept. 30th, 1903. AMAZED.

*** The subject of organic chemistry is being taken bodily from the Intermediate Examination for the M.B. and put into the Preliminary Scientific Examination. The test examination to which "Amazed" refers is provided for those who have missed the subject in their Preliminary Scientific Examination. If they make certain of passing the test now they will not be confronted with the subject at the Intermediate Examination for the M.B. We have reason to think that the regulation of the University is less arbitrary than it looks.—ED. L.

THE IMMENSITY OF INDIA.

ACCORDING to the Statistical Year Book of Canada, an admirable annual which is compiled by the Department of Agriculture at Ottawa and deals not only with Canadian statistics but with statistics of the chief countries of the world, India imports more from Great Britain (65·23 per cent.) and from British possessions (13·53 per cent.) than any other colony or dependency within the British Empire, and India likewise exports to Great Britain and British possessions more than any other country within the empire. The population of India for 1901 is given as 295,252,700. These figures are enormous compared with the population of Canada, which is only between 5,000,000 and 6,000,000 (5,456,931 in 1902), with the population of Australia which is only between 4,000,000 and 5,000,000, and with the population of New Zealand which is only between 800,000 and 1,000,000. The extraordinarily large population of India should be remembered when dealing with the mortality statistics of our Eastern empire. The terribly large numbers of deaths which are recorded in our columns and which in our other colonies would imply the decimation of whole communities, in India only amount to a fractional alteration in the death-rate.

A POINT IN THE SALE OF A PRACTICE.

To the Editors of THE LANCET.

SIRS,—I should be much obliged if you would kindly answer the following questions: 1. When one medical man sells his practice to another is it, or is it not, the custom for the vendor to hand over to the purchaser the case books of the patients of the practice? 2. Can such transference of the patients' case books be regarded as a breach of confidence between the patients and the vendor? 3. If the vendor is not compelled to give up the patients' case books to the purchaser, and if he refuses to part with them, can the purchaser compel the vendor to let him have a list of the names and addresses of the patients of the practice which he has bought? Thanking you in anticipation,

I am, Sirs, yours faithfully,

Sept. 26th, 1903. ALPHA.

*** 1. The case books are not, as a rule, delivered up and in our opinion should not be delivered up. 2. If a patient continues to employ his or her original medical man's successor, the successor would naturally expect from his predecessor enlightenment upon the case and would take measures to obtain it; but as the past medical history of persons who are not his patients cannot concern a medical man no hardship is inflicted upon the successor to a practice in not having access to his forerunner's case books. 3. The purchaser of a practice satisfies himself as to the identity of his probable patients out of the vendor's ledger and day-book, not out of his case books.—ED. L.

"HOW TO GET FAT FOR FIVE DOLLARS."

THE *Chicago Record Herald* states that this is what an Iowa American advertised, with the result that hundreds of people applied to him for the secret and were told to get it at the butcher's. The advertiser, who is now said to be under arrest, must have a good knowledge of the weaknesses of human nature and have felt confident, judging from the profuse and expensive advertisements of quacks, that his ingenious little scheme was an easy road to wealth, and there is no doubt he was quite right in expecting to hook a large number of simpletons. It was only a question of the right bait.

PICRIC ACID IN THE TREATMENT OF BURNS.

To the Editors of THE LANCET.

SIRS,—May I through the courtesy of your columns offer my thanks to the many correspondents who have so kindly answered my query re the picric acid treatment of burns? Their comments thereon have been very interesting and instructive. It may interest them to hear that I have quite recently treated a case in this manner with the most satisfactory result. I am, Sirs, yours faithfully,

Sept. 26th, 1903. J. JOHNSTONE REDMOND.

To the Editors of THE LANCET.

SIRS,—I have found the following treatment to give very satisfactory results in the case of localised burns of moderate severity. I employ the cold saturated solution of picric acrid for the first two or three days, changing the dressing every morning. I then use a lotion compounded as follows: zinc sulphate, 30 grains; calamine, 30 grains; and powdered boric acid, one drachm. I dispense it as a powder with the directions to mix one or two teaspoonfuls to a pint of hot water in which the part is immersed for half an hour three times a day. During the intervals a dressing is applied consisting of lint soaked in the same lotion and put on as a fomentation. I find the preliminary treatment with picric acid extremely valuable as a local anæsthetic, but judging by recent correspondence it is inadvisable to persist with it for more than three days. I always open up all blebs before I begin the second part of the treatment.—I am, Sirs, yours faithfully,

EDWARD BIGG, M.A., M.R.C.S. Eng., L.R.C.P. Lond.

Stafford Infirmary, Sept. 28th, 1903.

CIRCUMCISION AND FLAGELLATION AMONG THE FILIPINOS.

Lieutenant Charles Norton Barney of the medical department of the United States Army read an interesting paper upon the above subject at the twelfth annual meeting of the Association of Military Surgeons of the United States. Circumcision among the Filipinos, whether originally practised from religious ideas or not, is now a mere fashion. The operation is performed as follows. The operator provides a polished piece of wood, sufficiently curved and of such length that when one end of it is driven into the ground the boy to be operated upon can squat "on his hams"—practically sit on his calves—and insert the free end of the stick, which is pointed, between the head of his penis and his foreskin. After

the foreskin has been drawn over the point of the apparatus, which is called "*tamurung*," the operator, also in the squatting position, picks up a sharp knife and places it so that the edge rests lengthwise on the foreskin. Then, holding the knife in place with one hand, he gives it a sharp blow with a stick of wood or a joint of cane held in the other. If he does not succeed in entirely exposing the head of the penis at one blow he gives a second or even a third. Guava leaves, which are astringent, are afterwards applied in the form of a paste made by chewing the leaf, or in the form of a powder prepared by burning them, and the wound is bandaged. The dressing is changed daily. It will be seen by this description that the operation should not strictly be called circumcision, for the foreskin is apparently not removed but simply slit up in its long axis. With regard to flagellation it is still practised in the out-of-the-way parts of the islands, although discouraged by the church. It is apparently done from no penitential motive but is the result of a vow made to the Deity in return for the occurrence of some wished-for event. The "penitent" both flagellates himself and is also beaten by a friend with a piece of wood with little metal points in it. Most people, of course, are familiar with the mediæval sect of Flagellants who committed such excesses in the fourteenth century, and there are many devotees still left in eastern countries who practise flagellation. In Persia, for instance, during the Moharam festival in commemoration of the death of Husein and Ali, the devotees may be seen marching through the streets of the town, some of them cutting themselves with swords until they are covered with blood, while still other devotees, stripped naked to the waist, thrash themselves vigorously with heavy chains on both the back and chest.

WATER GAS.

To the Editors of THE LANCET.

SIRS,—As a constant reader and subscriber to THE LANCET of over 40 years I have invariably noticed your courteous spontaneity in your readily replying to any query of public or professional interest. I have had a few calls the last week from two or three leading residents here, asking me to aid their earnest endeavours to stay the manufacture by the gas company of water gas, as although made in the small hours of the morning the most offensive fumes arising from the H_2S evolved caused them frequent headaches, nausea, and general malaise. My own family have also complained not infrequently of similar symptoms and, too, from the same cause—i.e., from the noxious fumes and sickening smell of the H_2S. Some time since I attended with one or two others our urban district council and presented a numerously signed petition praying the attention of the authorities to the prevention of this nuisance, as its continuance was undoubtedly to the evident discomfort and detrimental to the health of the neighbourhood of this beautiful and otherwise most healthy and desirable locality.

We are, however, met by the response that H_2S is not at all an unhealthy smell, that its production is a necessity for the making of water gas, and that it not being an alkali the commissioners are powerless to prevent its production—*ergo*, I ask you, Sirs, your numerous readers, medical officers of health, &c., *is this really so?* I have now retired from practice and find I have left my works on chemistry to my successor, but I am strongly of the opinion that sulphuretted hydrogen is not only a disgusting smell that must not be allowed to continue, but the inhaling of the fumes is unhealthy and detrimental to the well-being and comfort of the inhabitants of the district.

I am, Sirs, yours faithfully,

FREDERICK H. ALDERSON, M.D. St. And.

Bournemouth West, Sept. 28th, 1903.

*** The constant occurrence of even small quantities of sulphuretted hydrogen in the air near dwelling places is not only a nuisance but a decided source of injury to health. The sanitary authority should suppress such a nuisance and poisoning of air.—ED. L.

PATIENTS AND OPERATIONS.

To the Editors of THE LANCET.

SIRS,—From an ethical point of view, ought such operations as colotomy and gastrostomy to be performed unless the patients are made aware of their nature and the immediate consequences? Sometimes these operations appear to be done without the patients having any idea of what they involve.

I am, Sirs, yours faithfully,

Sept. 26th, 1903. HOUSE SURGEON.

*** There can be no question that before any operation is performed its necessary consequences should be explained to the patient, and especially is this the case (if there can be degrees of right in such matters) when the operation only temporarily postpones death and yet is accompanied by much annoyance and discomfort.—ED. L.

A NEW PATENT TOBACCO PIPE.

Messrs. Bewlay and Co., Strand, W.C., have submitted for our inspection a new patent pipe, the special feature of which is an ivory cooling-plate and dirt-catcher. This little appliance can be drawn out from the pipe by the stem and wiped and so all results of foulness can be avoided. It is simple in its working, easily cleaned, and cannot get out of order—three qualities which are absent from the majority of patent devices for the assistance of the awkward smoker. All that is necessary is that the bowl and the mouthpiece should be pulled apart after use, that the cooling-plate should be wiped, and the stem shaken to remove any moisture.

CREDULITY INDEED.

WE are often asked to confirm or to contradict stories the details of which are so obviously absurd that the mere invention of them becomes remarkable. The letter which follows is a good illustration of the sort of thing that many people—people with some pretence to education—positively believe.

To the Editors of THE LANCET.

SIRS,—I would like to ask if it were possible for an ordinary domestic black-beetle to pass through the ear and into the brain of a child of, say, ten months of age, to remain alive and to move about upon the brain of the child, who also remained alive long enough for the x rays to be applied by which means the presence of the insect was discovered; for the Home Secretary to be applied to for authority to employ a fatal dose of an opiate to the child to end its sufferings, an operation for the removal of the beetle being impracticable? Further, I would like to ask whether such a case is known to have occurred within, say, the last five years of medical experience.

I trust you will pardon me troubling you with this, which seems an absurd question, but such a case was recently related by a declared relative of the infant in question. From the merest knowledge of the structure of the human ear I ventured to repudiate the story as absurd, but as it was told on apparently good authority and as several ladies were much distressed at hearing it, I thought I would venture to submit it to an indisputable authority. Presumably, the creature did not eat its way through the ear, for the cause of the patient's irritation was only disclosed by the x rays. I am, Sirs, yours obediently,

A. B.

Our correspondent need have no hesitation in contradicting either the declared relative or the distressed ladies. The whole story is, as he obviously supposes, a piece of monstrous imagination.

Seloc.—1. The method described by MM. Elmassion and Migone for the demonstration of the intimate structure of the trypanosomes, especially Trypanosoma equinum, is as follows. Fixing: Fix the coverslip film preparation of the blood containing the trypanosomes in absolute alcohol for at least 12 hours. Treat in a bath of 5 per cent. bichromate of potassium for from one to three hours. Wash thoroughly and carefully in water. Staining: Prepare two staining solutions.

Solution A.		*Solution B.*	
Hæmatin	0·5 gramme.	Magenta red	1 gramme.
Ammonia alum ...	5·0 grammes.	Absolute alcohol ...	10 c.c.
Distilled water ...	100 c.c.	Distilled water... ...	100 c.c.

Mix one drop of solution B with five cubic centimetres of solution A. Stain the coverslip film with the mixture for about 15 minutes. (Note.—The stability of the hæmatin solution and its selective power are improved by the addition of 20 grammes per cent. of glycerine.) A successful preparation by this method shows the protoplasm of the trypanosome purplish red, the flagellum and membrane a bright red, the nucleus violet, and the centrosome rose-coloured or sometimes light brown.—2. The stain for general use which has given the best results in our hands is Leishman's modification of Romanowski's stain.

First Aid.—"First Aid to the Injured," by S. Osborn, F.R.C.S. "Illustrated Lectures on Nursing and Hygiene," by R. L. Roberts, M.D. (London: H. K. Lewis); "Nursing: General, Medical, and Surgical," by W. J. Hadley, M.D. (London: J. and A. Churchill); and "Health and Home Nursing," by Florence L. Mather (London: James Clarke and Co.). The St. John Ambulance Association, St. John's Gate, Clerkenwell, also publishes diagrams and a syllabus which will be found useful to those desirous of giving lectures.

W. A.—Our correspondent should consult his usual medical attendant.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Oct. 1st, 1903.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radia in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 a.m.
Sept. 25	30·08	S.W.	0·02	109	67	56	60	62	Cloudy
,, 26	30·23	S.W.	...	101	67	54	55	56	Overcast
,, 27	30·02	S.	...	91	66	55	57	58	Overcast
,, 28	29·87	S.W.	0·25	107	68	58	59	60	Overcast
,, 29	29·73	S.	2·10	89	69	60	64	66	Cloudy
,, 30	29·91	S.W.	0·38	112	70	58	59	61	Cloudy
Oct. 1	29·83	S.E.	...	85	67	57	58	59	Overcast

During the week marked copies of the following newspapers have been received: *Cork Constitution, Bradford Daily Telegraph, Newbury Weekly News, Highland News, Bristol Press, Glasgow Daily Record, Daily Mail, Morning Post, Daily News, Daily Chronicle, The Engineer, The Welshman, Westminster Gazette, Hertfordshire Mercury, Windsor and Eton Express, South Wales Daily News, Manchester Guardian, City Press, Mid-Sussex Times, Walsall Advertiser, Herts Advertiser, Times of India, Mining Journal, &c.*

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (5th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Royal Free (2 P.M.), Guy's (1.30 P.M.).

TUESDAY (6th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Royal Ear (3 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Soho-square (2 P.M.).

WEDNESDAY (7th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.) Metropolitan (2.30 P.M.), London Throat (9.30 A.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M).

THURSDAY (8th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat, (9.30 A.M.), St. Mark's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.).

FRIDAY (9th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing Cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (9.30 A.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat Golden-square (9.30 A.M.), City Orthopædic (2.30 P.M.), Soho-square (2 P.M.).

SATURDAY (10th).—Royal Free (9 A.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing Cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), Throat, Golden-square (9.30 A.M.), Guy's (1.30 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

WEDNESDAY (7th).—OBSTETRICAL SOCIETY OF LONDON (20, Hanover-square, W.).—8 P.M. Specimens will be shown by Mr. A. Doran (for Dr. Batchelor, Dunedin) and others. Short Communication:—Dr. Hellier: Case of Abdominal Pregnancy Secondary to Partially Ruptured Pregnant Tube. Papers:—Mr. Malcolm: An Operation for Extra-uterine Fœtation between the Third and Fourth Months of Gestation with Removal of a Living Fœtus and much trouble from Hæmorrhage during Convalescence.—Dr. Lockyer: A Case of Ruptured Tubal Gestation in which the Ovum continued to grow for about Four Months, the Gestation Sac becoming implanted on the Omentum.

THURSDAY (8th).—BRITISH GYNÆCOLOGICAL SOCIETY (20, Hanover-square, W.).—8 P.M. Specimens will be shown by the President and Dr. Macnaughton Jones. Cases:—Dr. Macnaughton Jones: (1) Notes on a Case of Colliotomy in a Patient for the Third Time; (2) Extensive Cellulitis after Hysterectomy.—Dr. Hodgson: Incarcerated and Irreducible Femoral Hernia in a Woman. Dr. Macnaughton Jones will exhibit a Peritoneal Knife.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY (Board Room of the Great Northern Central Hospital, Holloway-road, N.).—9 P.M. Paper:—Prof. R. J. Hewlett: Insects as Carriers of Disease.

FRIDAY (9th).—THE INCORPORATED SOCIETY OF MEDICAL OFFICERS OF HEALTH (Holborn Restaurant, London, W.C.).—5 P.M. Annual Meeting. Presidential Address:—Dr. J. Groves: Rural Water Supplies.

CLINICAL SOCIETY OF LONDON (20, Hanover-square, W.).—8.30 P.M. Papers:—Sir Dyce Duckworth and Mr. H. T. Butlin: A Case of Erosive Gastric Ulcer with Severe Hæmatemesis, Operation, Recovery.—Dr. F. Taylor (President): A Case of Acute Pancreatitis.—Mr. A. A. Bowlby, C.M.G.: A Case of Acute Pancreatitis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

TUESDAY (6th).—NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Queen-square, Bloomsbury).—3.30 P.M. Dr. C. E. Beevor: Cerebral Localisation.

THURSDAY (8th).—SAMARITAN FREE HOSPITAL FOR WOMEN (Marylebone-road, N.W.).—3 P.M. Mr. A. Doran: Broad Ligament Tumours.

FRIDAY (9th).—NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC (Queen-square, Bloomsbury).—3.30 P.M. Dr. C. E. Beevor: Cerebral Circulation.

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It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

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Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used.

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index to Vol. I. of 1903, which was completed with the issue of June 27th, and the Title-page to the Volume, were given in THE LANCET of July 4th.

VOLUMES AND CASES.

VOLUMES for the first half of the year 1903 are now ready. Bound in cloth, gilt lettered, price 18*s.*, carriage extra.

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